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MONTANA

State Aviation System Plan
Executive Summary

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Montana Department of Commerce
Aeronautics Division
in cooperation with the
Federal Aviation Administration
February, 1989

Montana State Aviation System Plan

Study Objectives

The purpose of the State Aviation System Plan was to thoroughly examine aviation in Montana and to prepare a planning document guiding aviation development for a 20 year period. To accomplish this, aviation deficiencies were identified and system wide and individual airport needs were defined.

- [illegible]
- [illegible]
- [illegible]
- [illegible]

Existing Aviation System

Montana's aviation system consists of 114 publicly owned airports with varying levels of facilities and services as shown below.

- [illegible] have scheduled airline service.
- [illegible] airports which enplane 10,000 or more [illegible] scheduled airline passengers annually (Butte, Billings, Bozeman, Great Falls, Helena, Kalispell and Missoula).
- [illegible] commercial service airports with enplanements [illegible] scheduled airline passengers annually (Glasgow, Miles City, Sidney and West Yellowstone).
- [illegible] general aviation airports receive scheduled airline service (Glendive, Havre, Lewistown and Wolf Point).

The aviation system includes navigation, weather and flight information aids for communication systems such as:

- [illegible]
- [illegible]
- [illegible]
- [illegible]
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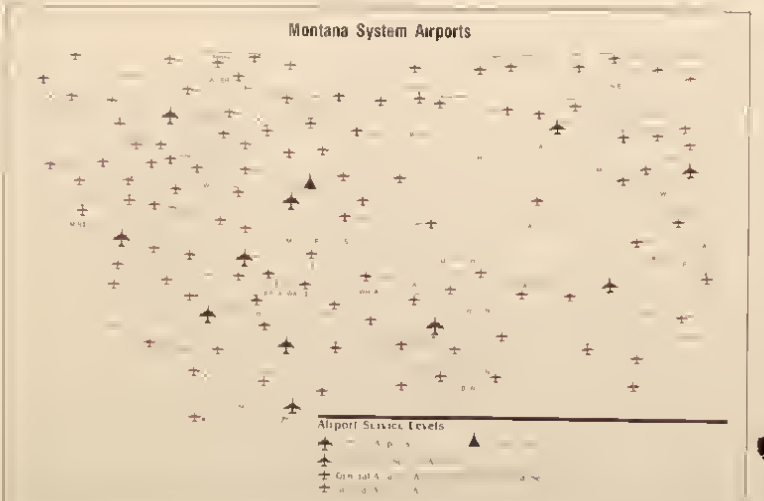


Cover: Northwest Airlink's New 19 Passenger Jetstream Super 31

Commercial Airline Service

Since the deregulation of the airline industry in 1978, Montana has experienced numerous changes in the amount and kind of airline service provided. The most notable change has been the increased use of commuter turbo prop aircraft instead of larger jets such as the Boeing 727 and 737 type aircraft. Although some airports have experienced a decline in jet service, others have seen increases in all levels of service.

Currently there are over 62,000 scheduled commercial flights per year serving 15 destinations within the state and several regional destinations (i.e., Minneapolis, Denver, Salt Lake City and Spokane). The commercial airlines transport approximately 900,000 passengers and over 5,600 tons of cargo each year in Montana.

Delta's Boeing 737

Essential Air Service

The Airline Deregulation Act of 1978 guaranteed a 10 year Essential Air Service (EAS) Program whereby federal subsidies are paid to airline companies that provide passenger service to communities determined to be eligible under the program. Congress has extended the EAS Program until 1998. Unfortunately, adequate program funding has historically been a problem. Changes to the EAS Program caused by insufficient funding may have a significant impact on airline service to Montana's 8 EAS communities (Glasgow, Glendive, Havre, Lewistown, Miles City, Sidney, West Yellowstone, and Wolf Point).

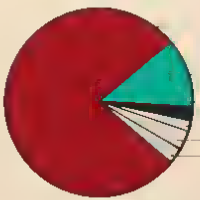
Fly-In at West Yellowstone, WYT

General Aviation Activity

There are approximately 3,000 general aviation (GA) aircraft registered in Montana. Approximately 2,000 are located at the 114 publicly owned airports in the state. The others are based at private air strips. As shown below, a large majority (84%) of the GA aircraft are single engine.

Montana's Fleet Mix

Nationwide Fleet Mix

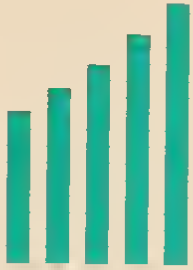


Approximately 660,000 GA operations annually occur at Montana's 114 publicly owned airports.

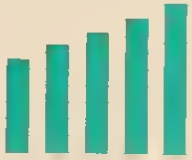
Aviation Forecast

Forecasts of aviation demand are the basis for determining the facilities that will be required in the future. Aviation is expected to grow slowly but steadily over the next 20 years.

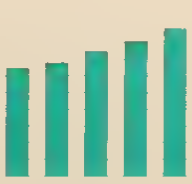
Forecast of Commercial Passenger Enplanements



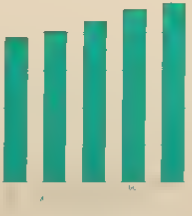
Forecast of Air Cargo



Forecast of G A Operations



Forecast of G A Based Aircraft*



Aviation Demand and Capacity

The forecasts show a slow rate of growth for the aviation industry in Montana A comparison of aviation demand with the physical capacity of existing airports reveals that no capacity problems are anticipated at any airport during the 20 year planning period

Individual Airport Requirements

Montana s public use airports were examined to determine what major improvements would be required during the planning period Since aviation is expected to grow slowly in the foreseeable future the emphasis was on safety improvements and upgrading airports to current standards The individual airport requirements included in the System Plan reflect only major improvement projects and do not address routine maintenance work Over $206 million worth of airport improvements are needed during the next 20 years

System-wide Recommendations

The components of the Aviation System were examined to determine what will be necessary to accommodate Montana s aviation future Recommendations outlined in the Plan include

- Create a 5 grant program for NPIAS airports involved in federal AIP projects
- Establish a 50 0 grant program for pavement maintenance projects at all GA airports
- Create a 50 50 grant program for improvements at non NPIAS airports
- Develop a commercial air service marketing program
- Improve the quality of public telephone and ground transportation at all community airports
- Install and maintain instrument approaches and develop accurate GA airport operations data
- Require all planning and construction documents for GA airports to be submitted to the State for the records review and comments
- Develop a weather data
- Establish a set of minimum operating guidelines for non controlled stations
- Reform Montana s zoning statutes to better protect airport activities
- Develop a set of minimum airport standards for GA airports
- Install two additional VOR stations one near Jordan and one near Broadus
- Restructure the Board of Aeronautics and empower them to set general policy and review the function of the Division

This document was prepared by Robert Peccia & Associates Graphics & Drafting Division February 1989
For more information on the State Aviation System Plan contact the Montana Aeronautics Division

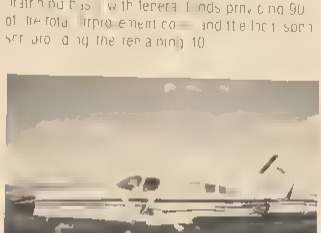
Airport Financing

Federal Funding

Major airport improvements have historically been financed with the assistance of federal grants. The most common federal funding sources used in Montana are:

- Federal Aid to Airports (AIP) funds for improvements at publicly owned airports
- Federal Aviation Administration (FAA) funds for specific projects
- Federal funds for transportation of goods (EAS) at designated airports
- Federal funds for improvements at military airports

In 1986 federal airport improvement grants totaled approximately $8.1 million. The current Airport Improvement Program (AIP) operates on a 90-10 matching basis with federal funds providing 90% of the total airport improvement cost and the local sponsor providing the remaining 10%.



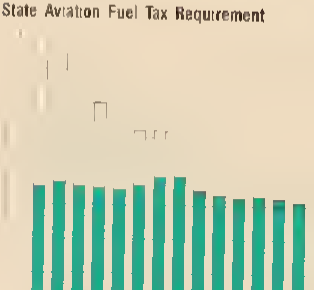
State Funding

The State Aeronautics Division offers several assistance programs including:

- Airport development grants
- Airport planning grants
- Assistance for the construction of new general aviation airports
- Loan program for publicly owned general aviation airports
- Discount fuel for state aircraft
- Weather data collection

These and other assistance programs are financed through several mechanisms. The majority of state funds come from a one cent per gallon aviation fuel tax which generates approximately $325,000 annually. This fuel tax has been in effect and has remained unchanged since the mid 1940's when it was first established. Inflation has had a devastating effect on the equivalent value of the gas tax revenues. Without additional revenues, the Aeronautics Division will experience a shortfall by 1991.

State Aviation Fuel Tax Requirement



Local Funding

Local financing for airport improvements is typically derived from a property tax mill levy of up to five mills. Local airports may also generate funds through revenue producing operations such as concessions, fuel flowage fees, land rentals, and hangar fees. A total of approximately $11.3 million is generated each year. Of this local revenue, $9.6 million is generated in the 7 counties with primary airports levying only $1.7 million for all the other airports in the state. Local airport financing has become increasingly difficult due to recent property tax reform legislation that froze property taxes at 1986 levels.

Economic Impact of Aviation

The State Aviation System Plan includes an analysis of the economic impact of aviation in Montana. This analysis concentrated on two major factors: employment and the amount of money spent by aviation travelers. Montana's airports employ 2,678 full time workers which represents approximately $56 million per year in employment income. General aviation travelers spend approximately $4 million annually in Montana while expenditures by air carrier passengers is over $101 million. Of these expenditures, approximately $13 million is directly attributable to aviation.

The total economic effect an airport has upon the surrounding community is determined by direct and indirect contributions to the local economy. The direct economic benefits include the $56 million of employment income and $13 million of traveler

Future Role of the Montana Aeronautics Division

The FAA is committed to a stronger partnership with State aviation agencies in carrying out their programs at general aviation reliever and small commercial service airports across the country. In the future, State aviation agencies will be responsible for playing a much larger role in traditional FAA programs.

The strength and effectiveness of Montana's Aeronautics Division and its programs currently impacts general aviation in Montana. The Aeronautics Division should provide leadership and direction in the development of our general aviation system by working cooperatively with the FAA and local airports in establishing development priorities. The Aeronautics Division should implement additional programs to provide financial assistance for improving and maintaining the State's general aviation and air carrier airports. The new programs should include financial grants for the following:

- 50% of the local share for all AIP projects ($50,000 annually)
- 50% of the local share for improvement to non-AIP eligible airports ($50,000 annually)
- 50% of the local share for pavement maintenance at GA airports ($100,000 annually)

These grant programs will provide the funds necessary to improve and maintain our state's system of airports. Without these funds, the local sponsors will find it increasingly more difficult, if not impossible, to improve and maintain their facilities.

The Aeronautics Division should continue to provide direction and leadership in aviation through a continuing planning effort. Continuing planning items should include an update of Montana's airports contained in the National Plan of Integrated Airport Systems (NPIAS), the development of capital improvements programs (CIP's) for the NPIAS airports, an airport safety and obstruction survey, and an evaluation of the weather data collection systems currently in operation or proposed for Montana.

Plan Implementation

The recommendations contained in the State Aviation System Plan address individual airport requirements as well as system wide recommendations. It also includes a prioritization of the individual airport improvements projects that should occur in the next 5 years.

The Montana Aeronautics Division could play a leading role in implementing the Plan if the recommended grant programs were established. The Aeronautics Division can provide leadership in aviation development and if Division programs are properly financed.

The Aeronautics Division should work cooperatively with the FAA, local airports, and aviation interest groups to implement the system wide improvements contained in the System Plan.

John Brennan of Darby, MT in his 1942 Stearman

Conclusion

Montana has been experiencing some changes in commercial airline service as a result of the deregulation of the airline industry. Commercial service will most likely remain unstable for the foreseeable future, when airlines search for the most profitable route combinations. The level of service provided will ultimately be decided by the airlines based on the market potential of our State.

The airports and other aviation facilities are generally in good condition and appropriate for the size and population of Montana. The greatest problem facing the general aviation airports is the lack of adequate funding for airport improvements and routine maintenance. This revenue shortfall must be corrected to assure a bright and safe future for aviation in Montana.

MONTANA
STATE AVIATION SYSTEM PLAN

Montana Department of Commerce
Aeronautics Division

In cooperation with the Federal Aviation Administration
under
Airport Improvements Program
AIP 3-30-0000-S1

January, 1989

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Chapter I
Introduction

CHAPTER I: INTRODUCTION

A. PROJECT BACKGROUND

Montana's State Aviation System Plan was first developed in 1974. The original plan has been updated two times, most recently in 1982. Montana's economic conditions and aviation industry have experienced unforeseen changes since the last update. Deregulation of the commercial airline industry, for instance, has altered the level and type of air service available in the state. The discussions regarding commercial air services and other elements of the 1982 plan are obsolete and no longer represent aviation conditions in Montana.

This update of the system plan is a cooperative effort of the Montana Department of Commerce, Aeronautics Division, and the Federal Aviation Administration. The intent of this study is to modify the existing plan to reflect accurately the current needs and trends of aviation in the state. The services of Robert Peccia & Associates, Helena, Montana, and Cress and Associates, Lexington, Kentucky, were retained by the Montana Aeronautics Division (MAD) to assist them in preparing this plan update.

A study design was initially prepared to define the important issues to be addressed in the development of the plan. In addition, an ad-hoc Technical Advisory Committee (TAC), consisting of technically-qualified local, state, and federal representatives, provided guidance for the consultant during preparation of this study.

This planning study was financed through a Federal Aviation Administration (FAA) Airport Improvements Program Grant and by the Montana Department of Commerce, Aeronautics Division.

B. PROJECT POLICIES

1. Study Issues

The specific issues which this Aviation System Plan addresses were identified during the development of the study design. They include the following:

- Role of the Montana Aeronautics Division system planning for airports in the state
- Impacts of commercial airline deregulation
- Determination of current airport activity levels
- Identification of facility and service requirements for individual airports
- Future of essential air service in Montana

- Need for improved navigation systems
- Airport/community land use compatibility
- Economic benefits of aviation
- Legislative funding policies affecting funding for aviation
- Development of a centralized airport data base
- Assessment of the conditions of airport pavements
- Recommendations and priorities for funding state airport projects

2. Goals and Objectives

The objectives identified for this study express physical, social, or economic achievements desired for the development and operation of the aviation system in Montana.

The overall goal of MAD is to enhance Montana's economic development by developing and promoting a safe and efficient aviation system for the movement of goods, services, and people within the state. The MAD Airport/Airways Bureau has established the following objectives to attain this end:

- To plan, implement, operate, and maintain state-owned and statewide systems or facilities in a manner that will meet the navigation and communication needs of Montana aviation
- To help determine the appropriate role and development requirements for each airport in Montana's airport system, and to help prioritize the financial assistance for development.
- To ensure the safety and utility of the state airport system.
- To enhance Montana's airport system and ensure the availability of adequate services and facilities in all parts of the state.
- To make available current and accurate information regarding Montana's aviation system through the publication of the Montana Airport Directory and the Montana Aeronautical Chart.

MAD's objectives served as guidelines in the development of the goals and objectives for this update of the Montana State Aviation System Plan. This plan's goals and objectives are intended to complement the objectives of MAD and address the needs of the aviation industry in Montana.

The primary goals and objectives of this System Plan Update are as follows:

Physical Goals and Objectives

- Develop a system of airports that meet accepted FAA, state, and local physical standards.

- Identify and enhance the capabilities of existing and future airports to operate in all kinds of weather.
- Provide a system of airports that is conveniently accessible to aviation users.
- Provide for optimum use of publicly- and privately-owned airport facilities
- Consider safety as a primary factor in the development of the plan.

Environmental Goals and Objectives

- Minimize the impacts of noise, air, and water pollution generated by the operations of the state's airport system.
- Ensure compatibility with local land-use patterns and plans.
- Strive for development of an energy-efficient system of airports.

Social Goals and Objectives

- Address the needs and desires of aviation system users.

Economic Goals and Objectives

- Develop funding mechanisms to implement the recommendations of the study.
- Enhance the opportunities for economic development and employment consistent with local and regional growth projections and comprehensive plans.
- Develop the best possible airport system, in a cost-effective manner, acknowledging the trade-offs between costs and benefits.
- Provide for a system of user charges that distributes the burden of capital investment, operation, and maintenance equitably between direct airport users and indirect beneficiaries of the system.

Public Participation Goals and Objectives

- Develop an awareness of the airport planning and development process.
- Ensure that the public and federal, state, and local officials have an opportunity to participate in the decision-making process during the development and implementation of the airport system plan.

C. PROJECT DESCRIPTION AND SCOPE

1. Procedures for Interfacing with Existing Plans

Existing planning studies and inventory records were used extensively to create the data base for this study. These sources of information provided historical records of aircraft operations and development at Montana's airports and, in some cases, plans for future airport expansion. All airport master plans produced since 1980 were utilized in the development of this plan. These master plans represent a

detailed, localized planning and research effort and contain valuable information on their respective airports.

A variety of other published reports were reviewed and referenced during the development of this plan. The principal reference documents used are listed below:

- 1980 Census Data
- FAA, Terminal Area Forecasts, FY 1987-2000
- FAA, Census of U.S. Civil Aircraft, 1985
- FAA, Airport Activity Statistics of Certified Route Air Carriers, 1986
- FAA, Tower Data
- FAA, Air Traffic Activity, 1985

Additionally, state and federal inventory records (Form 5010) were used to identify individual airport facilities across the state. The use of these sources provided a credible data base that incorporates existing information on aeronautical activity and airport facilities with the current airport development plans of the state and local communities.

2. Procedures for Data Collection

The airport facility information contained in the FAA 5010 inventory records was used as the initial point in the development of a data base which identifies the state's existing aviation facilities. On-site inventory inspections were conducted at 76 of the 114 publicly-owned airports throughout the state to supplement the information contained in the 5010 records. These inventories provided an opportunity to assess the accuracy of the 5010 records and to obtain additional airport information such as:

- Pavement conditions
- Condition of access roads to the airport
- Available hangar space
- Available services
- Local airport budgets
- Future airport development plans
- Unique operational characteristics of specific airports
- Aviation-related employment
- Surrounding land uses

- Navigational aids
- Limitations for future expansion
- Comments on current aeronautical activity from local airport operators

The 76 airports inspected for this study were selected based on the following criteria:

- Need for preliminary pavement analyses
- Need for automated weather observation systems (AWOS)
- Potential for significant expansion
- Development of additional physical facilities since the last master plan or airport layout plan (ALP)

Based on the above criteria, the following airports were selected for on-site inventory inspections:

Anaconda
Baker Municipal
Bert Mooney
Big Sandy
Big Sky Airpark
Big Sky Field
Big Timber
Billings-Logan Int'l.
Bridger Municipal
Broadus
Chinook Municipal
Choteau
Circle Town-Country
Columbus
Conrad
Cut Bank Municipal
Dawson Community
Deer Lodge
Dell Flight Strip
Dillon
Drummond
Ekalaka
Eureka
Fairgrounds Airpark
Ferndale Airfield
Fort Benton
Frank Wiley Field
Gallatin Field
Gardiner
Geraldine
Glacier Park Int'l.
Glasgow Int'l.
Great Falls Int'l.
Hamilton
Harlowton
Havre City-County
Helena Regional
Hot Springs
Johnson-Bell Field
Jordan
Kalispell City
Laurel Municipal
Lewistown
Libby
Liberty County
Lincoln
Malta
Mineral County
Mission Field
Plains
Polson
Poplar
Red Lodge
Riddick Field
Riggin Memorial
Ronan
Roundup
St. Ignatius
St.Labre Mission
Scobey
Seeley Lake
Shelby
Sher-Wood
Sidney-Richland
Stanford
Starr-Browning
Stevensville
Terry
Thompson Falls
Tillitt Field
Townsend
Troy (USFS)
Valley Industrial Park
White Sulphur Springs
Wolf Point Int'l.
Yellowstone

Ramp surveys were conducted at 14 airports to provide accurate operational data for use in the development of factors for fleet-mix, operations for fixed-based aircraft, occupants per aircraft, and the local/itinerant flight mix. The ramp surveys consisted of 30 hours of data collection over a three-day period at each of 14 airports. The survey results were adjusted by season, based on factors developed from historic aviation activity data gathered at Montana's four towered airports, to estimate annual aviation operations. These adjustments are discussed in detail in Chapter III.

The airport locations surveyed were selected based on facility size, number of fixed-based aircraft, and geographic location in an attempt to gather representative data

for airports of varying sizes and locations. Ramp surveys were performed at the following airports:

Chinook Municipal	Laurel Municipal	Sidney-Richland
Dawson Community	Libby	Stanford
Dillon	Scobey	Tillitt Field
Gallatin Field	Seeley Lake	Yellowstone
Hamilton		Shelby

Figure I-1 presents the airport locations where on-site inventories and ramp surveys were conducted for this plan.

3. Method of Analysis

The initial portion of the State Aviation System Plan consists of developing a data base which accurately identifies and describes Montana's existing aviation system. System components identified during this phase include airport facilities; enroute airspace utilization and navaids; aeronautical activity levels; applicable laws, ordinances, and regulations; current financial resources; and the economic benefits of aviation in Montana.

The second phase of this plan involves forecasting aviation demand based on records of historic aviation activity, current ramp surveys, existing airport master plans, and the FAA's "Terminal Area Forecasts" (TAF). Two forecasting methods - a historical trend analysis and a share-of-the-market analysis - are used to predict Montana's future aviation demands. These two methods and previously published projections are used to develop forecasts of aviation demand.

The aviation-demand forecasts can be compared to the capacity of the existing airport facilities and services to identify system deficiencies and the facility requirements necessary to meet the state's future aviation demand. Alternative airport systems capable of meeting the state's future needs are outlined and evaluated during this phase of the study.

The final phases of the study include developing recommendations to enhance the safety and utility of Montana's airport system and a plan to implement these improvements. These recommendations integrate the improvement of both the state's airport system and individual airports.

Figure I.1
Data Collection And Inventory Locations

Chapter II

Existing System Inventory and Analysis

CHAPTER II: EXISTING SYSTEM INVENTORY AND ANALYSIS

The purpose of this chapter is to present an inventory of aviation facilities and conditions in the State of Montana. The following major topics are discussed:

- Airport facilities
- Airspace utilization and navaids
- Aeronautical activity
- Surface transportation
- Land-use and environmental considerations
- Socio-economic factors
- Applicable laws, ordinances, and regulations

Information gathered for these discussions was collected from a variety of sources including on-site airport inventory inspections, FAA 5010 forms, published information, and interviews with airport managers.

A. AIRPORT FACILITIES

This section contains a summary of the existing airport facilities within the state. The only airports considered in this inventory, however, are those which are publicly-owned and open to the public. No information is presented in this section for the privately-owned airports in Montana since no State control exists over these facilities.

A preliminary data base of airport facilities was developed through the use of existing FAA inventory records and airport master plans. This base information was then field-verified, revised, and organized in its final form after completion of the on-site inventory inspections. The airport facilities inventoried included lengths, widths, and surface types of the airport's runway(s); taxiway configurations; runway lighting systems; rotating beacon and navigational aids; and hangar space. The final compilation of the airport facilities data base for Montana's airports is contained in Appendix A, "Existing Public-Use Airport Facilities." Detailed facilities data for each airport is listed in the Appendix.

1. Airport Classifications

Airports are classified according to the type of aircraft being served. The two primary types of airports are transport and utility with subcategories as required to provide

a suitable range of classifications for service to operating aircraft. The FAA provides detailed airport classifications criteria according to approach speed, wing span, and aircraft type in FAA Advisory Circular 150/5300-4B. General categories are described as follows:

a. Transport Airports

Transport airports are designed, constructed, and maintained to serve aircraft with approach speeds of 121 knots or more. Transport airports are further categorized into design groups according to aircraft wing span. Specific design considerations for transport airports are contained in FAA Advisory Circular 150/5300-12.

b. Utility Airports

Utility airports are intended for aircraft with approach speeds less than 121 knots. Utility airports are further classified by runway length according to the type of aircraft operations to be served as follows:

Basic Utility- Stage I - These airports serve about 75% of the single-engine and small twin-engine airplanes used for personal and business purposes.

Basic Utility - Stage II - These airports serve all of the airplanes for Stage I plus some small business and air-taxi type twin-engine airplanes requiring longer runway lengths.

General Utility-Stage I - These airports serve all small airplanes (defined as aircraft of 12,500 pounds or less maximum certified takeoff weight). Precision approach operations are not usually anticipated.

General Utility - Stage II - These airports serve the larger airplanes with approach speeds up to 121 knots and wing spans up to 79 feet. These airports typically have the capacity for precision approach operations.

Airport classifications for each public-use airport in Montana is listed in Appendix A, "Existing Public-Use Airport Facilities."

2. Airport Service Levels

Airport service levels reflect the type of aviation service that is provided to the associated community. Service levels are used by the FAA primarily to establish federal funding categories and to assist in prioritizing airport development projects. Service levels are not intended to dictate what types of aircraft will be based at a specific airport or conduct operations there. The following service levels were used for this study:

- Primary Airports (PR) enplane 10,000 or more scheduled air service passengers annually.

- Commercial Service Airports (CS) are public airports which enplane 2,500 or more passengers annually and receive scheduled passenger air service.
- Reliever Airports (RL) reduce congestion at commercial-service airports and provide additional general aviation access to the overall community.
- General Aviation Airports (GA) are public airports which enplane less than 2,500 passengers annually. Some GA airports may receive scheduled air service.

The associated service level for each of the public use airports in Montana is listed in Appendix A, "Existing Public-Use Airport Facilities."

3. Description of the Existing Airport System

Currently, there are 114 publicly-owned, public-use airports in Montana. All public-use airports are considered to be part of the State Airport System. The name of each airport is listed below, in alphabetical order. The location of each facility is shown graphically on Figure II.1.

Anaconda*
Augusta
Babb
Baker Municipal*
Belle Creek
Benchmark (USFS)*
Bert Mooney, Butte*
Big Sandy*
Big Sky Airpark, Ennis
Big Sky Field, Culbertson*
Big Timber*
Billings-Logan Int'l.*
Boulder
Bridger Municipal
Broadus*
Canyon Ferry
Chinook Municipal*
Choteau*
Circle Town-Country*
Columbus
Condon (USFS)
Conrad*
Cut Bank Municipal*
Dawson Community, Glendive*
Deer Lodge*
Dell Flight Strip
Denton
Dillon*
Drummond
Dutton
East Poplar Int'l.
Ekalaka
Eureka*
Fairfield
Fairgrounds Airpark, Hardin
Fairview
Ferndale Airfield
Fort Benton*
Frank Wiley Field, Miles City*
Gallatin Field*
Gardiner*
Geraldine
Glacier Park Int'l., Kalispell*
Glasgow Int'l.*
Great Falls Int'l.*
Hamilton*
Harlowton
Havre City-County*
Helena Regional*
Hinsdale
Hogeland
Hot Springs
Hysham
Johnson-Bell Field, Missoula*
Jordan*
Kalispell City
Laurel Municipal
Lavina
Lewistown*
Libby*
Liberty County, Chester*
Lincoln*
Malta
Meadow Creek (USFS)
Mineral County, Superior*
Mission Field, Livingston*
Morgan (Border)
Nashua**
Opheim
Ophow Ranch
Plains*
Polson*
Poplar*
Red Lodge*
Richey
Riddick Field, Phillipsburg*
Riggin Memorial, Harlem*
Rock Creek-Elliot, Clinton
Ronan*
Ross Int'l., Sweetgrass
Roundup
Ryegate
St. Ignatius
St. Labre Mission, Ashland
Schafer (USFS)
Scobey
Seeley Lake
Shelby*
Sher-Wood, Plentywood*
Sidney-Richland*
Spotted Bear (USFS)
Stanford*
Starr Crowning
Stevensville
Sunburst
Terry*
Thompson Falls*
Three Forks*
Tiber Dam
Tillitt Field, Forsyth*
Townsend*
Troy (USFS)
Turner*
Twin Bridges*
Valier*
Valley Industrial Park, Glasgow
Whetstone Int'l., Del Bonita
Whitefish
White Sulphur Springs*
Wilsall
Winifred*
Wisdom
Wolf Point Int'l.*
Yellowstone, West Yellowstone*
Yellowtail Dam, Fort Smith

*Existing airports included in the FAA's National Plan of Integrated Airport Systems (NPIAS).
**The Nashua Airport was closed during the course of this study in 1987.

Airport Service Levels

- Primary Airports
- Military Base
- Commercial Service Airports
- General Aviation Airports with Commercial Service
- General Aviation Airports

Figure II.1
Existing System Airports

An examination of the 114 public airports in the state shows that:

- 66 airports are acknowledged and included in the FAA's National Plan of Integrated Airport Systems (NPIAS). (Six additional locations have been identified in the NPIAS for proposed new airports: Ashland, Ekalaka, Ennis, Hardin, Lodge Grass, and Colstrip.)
- 15 are classified as Transport (T) airports
- 8 are classified as General Utility (GU) airports
- 41 are classified as Basic Utility (BU) airports
- 7 airports have paved runways which are shorter than Basic Utility (BU-) length requirements
- 44 are classified as Less than Utility (LU) airports
- 7 are considered Primary (PR) airports (Butte, Billings, Bozeman, Great Falls, Helena, Kalispell, and Missoula)
- 4 are considered Commercial Service (CS) airports (Glasgow, Miles City, Sidney, and West Yellowstone)
- None are considered Reliever (RL) airports
- 107 are considered General Aviation (GA) airports
- 71 have at least one paved runway
- 44 have only turf, gravel, or stabilized runways
- 77 are equipped with runway lighting systems
- 8 have precision approach (P) capabilities
- 13 have non-precision instrument approach (NPI) capabilities
- 2 have circling (C) pattern instrument approach capabilities
- 92 have visual, flight-rule (VFR) approaches only.

B. Airspace Utilization and Navaids

This section examines the airspace utilization patterns and routes within Montana and the navigational facilities available within the state.

1. Airspace Terminology

The airspace structure in Montana, as well as the rest of the nation, consists of uncontrolled and controlled airspace. Uncontrolled airspace is that portion of airspace within which FAA Air Traffic Control (ATC) does not have authority nor the responsibility to exercise any control over air traffic. A large portion of the airspace over

Montana is uncontrolled. Controlled airspace are those areas designated as positive control areas, continental control areas, control areas, control zones, terminal control areas, transition areas, and VOR Federal Airways within which some or all aircraft may be subject to air traffic control. Some types of controlled airspace require special radio and navigational equipment and certain pilot ratings. The various types of controlled airspace are defined below and are shown on Figure II.2.

Positive Control Area: All flights are controlled within this area which extends from 18,000 feet MSL to flight level 600 (approx. 60,000 feet MSL). Aircraft within this airspace are required to operate under instrument flight rules (IFR). Pilots must be instrument rated, and the airplane must be equipped with instruments and equipment required for IFR operations and a radar transponder.

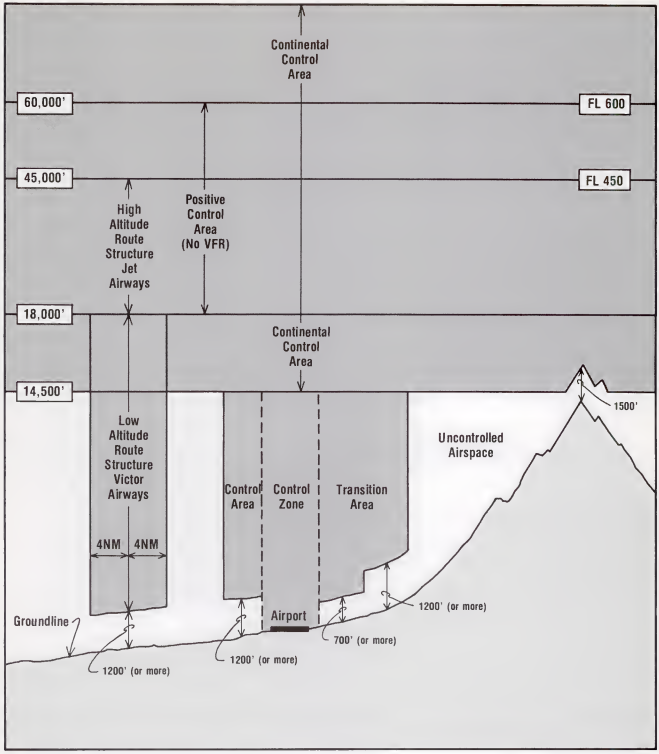
Continental Control Area: Consists of all airspace at and above 14,500 feet MSL over the 48 contiguous states and most portions of Alaska. The continental control areas do not include the airspace less than 1,500 feet above the ground. This control area was established to increase visibility and cloud clearance minimums at the higher altitudes at which high-performance aircraft fly. VFR operations are allowed within the portion of the continental control area below 18,000 feet MSL if there is at least 5 miles of visibility and 1 mile horizontal and 1,000 feet vertical separation from all clouds.

Control Areas: Consist of the airspace designated as VOR Federal Airways, additional control areas, and control area extensions which include transition areas. At least a 1,000-foot ceiling and 3 miles visibility are required to conduct VFR flights within control areas.

VOR Federal Airway: Each airway is based on a centerline that extends from one radio navigational aid or intersection to another navigational aid specified for that airway. The controlled airspace begins 1,200 feet above the ground and extends up to but not including 18,000 feet MSL. Each airway includes airspace within parallel boundary lines, normally 4 nautical miles on each side of the airway centerline. The airways over Montana are discussed in more detail in the next section of this chapter.

Transition Areas: This type of controlled airspace extends from airways to airports for which an instrument approach procedure has been established. These transition areas extend upward from 700 feet to 1,200 feet above the surface to the base of the continental control area at 14,500 feet MSL. The transition area enables an instrument pilot to remain within controlled airspace as he descends for an instrument approach at an airport.

Control Zones: Control zones are established at certain airports in order to provide air traffic control over aircraft taking off or landing when instrument conditions exist. A control zone may include one or more airports and is normally a circular area with a radius of 5 statute miles and any extensions necessary to include instrument departure and arrival paths. This form of controlled airspace extends upward from the surface to the base of the continental control area. Control zones exist at 13 of Montana's airports (Billings, Bozeman, Butte, Cut Bank, Glacier Int'l, Glasgow, Great Falls, Havre, Helena, Livingston, Lewistown, Miles City, and Missoula).



Controlled Airspace

Uncontrolled Airspace

Figure II.2

Airspace Structure Diagram

Airport Traffic Area: This form of controlled airspace exists within 5 statute miles of an airport with a control tower when the tower is in operation. These areas were established to provide separation and orderly flow of traffic at towered airports. Two-way radio communications with the tower are required before entering the airport traffic area. This airspace extends from the surface up to but not including 3,000 feet above ground level. There are 4 airport traffic areas in Montana (Billings, Great Falls, Helena, and Missoula).

Special Use Airspace: Consists of that airspace where the nature of certain activities within the airspace, or in the proximity to the airspace, requires limitations upon aircraft operations. Types of special use airspace are prohibited areas, restricted areas, warning areas, alert areas, and military operation areas. The only type of special use areas in Montana are military operation areas (MOA). MOA's are established to separate military training activities from civilian instrument-flight traffic. Whenever an MA is being used for military training, non-military IFR traffic may be cleared to pass through the area if IFR separation can be provided by Air Traffic Control. If not, ATC will reroute or restrict non-military IFR traffic in the airspace. The military operation areas in Montana are shown on Figure II.5 later in this chapter and include the Hays MOA, Williston MOA, Loring MOA, Powder River A MOA, and Powder River B MOA.

In addition to the airspace controlled by FAA regulations, certain areas in Montana are regulated by other governmental agencies, in particular, flight over chartered National Park Service areas, U.S. Fish and Wildlife Service areas, and U.S. Forest Service areas. Federal regulations prohibit airdrops by parachute and the landing of aircraft on lands or waters administered by these agencies without authorization from the respective agency. All aircraft are requested to maintain a minimum of 2,000 feet above the surface of all national park lands; national wildlife refuges; big game refuges, game ranges, and wildlife ranges administered by the U.S. Fish and Wildlife Service; and wilderness and primitive areas administered by the U.S. Forest Service. Some of the larger areas affected by these regulations are the C.M. Russell National Refuge along the Fort Peck Reservoir; Glacier and Yellowstone National Parks; the Great Bear, Bob Marshall, and Scapegoat Wilderness Areas; the Lee Metcalf Wilderness and Wildlife Refuge; the Anaconda-Pintlar Wilderness; the Absarokee-Beartooth Wilderness; and numerous smaller federally-administered lands.

2. Navaids

A navigational aid (navaid) is any visual or electronic device, airborne or on the surface, which provides point-to-point guidance information or position data. There are a variety of navigational systems available throughout the state. Montana's navaid system is shown in Figure II.3 and discussed in detail below:

VOR, VORTAC, VOR-DME: The term VOR stands for very high frequency omnidirectional range station. A VOR is a ground-based electronic navigation aid transmitting very high frequency navigation signals which are the basis for navigation in the National Airspace System. The VOR was developed for civilian aviation while TACAN, which stands for tactical air navigation, was developed as a military navigational aid. In many cases, it was determined practical to co-locate the civil VOR and the military TACAN at the same site. These integrated facilities are called VORTACS. A VORTAC facility provides 3 individual services: VOR azimuth for civilian aviation,

Figure II.3
Navigational Aids

TACAN azimuth for military aviation, and TACAN distance (DME) which is used by both civil and military aviation. A VOR-DME facility provides only the VOR azimuth and distance from the station. To utilize the VOR system, a plane must be equipped with the necessary distance-measuring equipment. Montana's VOR navigation system is comprised of 17 stations, 1 VOR, 5 VOR-DME, and 11 VORTAC. The range of the VOR signals are limited to line-of-sight reception and depend on the surface terrain and the altitude of the airplane, and may vary from 40 to over 130 nautical miles.

NDB: NDB stands for non-directional radio beacon. These beacons are typically installed at local airports. Unlike VOR signals, the low and medium frequency NDB transmissions are not limited to line-of-sight reception. To utilize the NDB signals for navigation, the aircraft must be equipped with automatic direction-finding (ADF) equipment. An ADF receiver and a bearing indicator are used to produce the necessary navigational information. When an NDB station is tuned in, the magnetic bearing from the plane to the station may be determined. Commercial broadcast stations which also transmit signals in the low and medium frequency range may also be utilized by the ADF equipment to navigate. There are 32 non-directional radio beacons located throughout Montana. The location of these NDB's is shown in Figure II.3.

Loran-C: The name "Loran" is an acronym for long-range navigation. The Loran system includes a series of low-frequency transmitters arranged in groups or chains. The transmitting stations are typically located hundreds of miles apart and produce a signal that travels close to the earth's surface and is not subject to the line-of-sight limitations of the VOR. The Loran-C signals have tremendous range which may be as great as 1,400 nautical miles under ideal conditions. To utilize the Loran system, a plane must be equipped with a Loran-C receiver. The Loran-C is a very precise instrument which can determine an aircraft's present position and calculate the latitude and longitude of that position. The Loran-C receiver usually has a variety of navigational functions and can provide the pilot with information regarding navigation, fuel consumption, wind, minimum safe altitudes, and a database of airports and navigational aids. Loran service is available in most parts of Montana with the exception of certain areas in eastern Montana which are in what is called the mid-continental gap. This gap in the system is scheduled to be corrected by the installation of an additional transmitting station to be located in northcentral Montana.

Radar: Air traffic control in Montana is provided by FAA radar service from Salt Lake City, Seattle, and Denver. The function of these Air Route Traffic Control Centers (ARTCC) is to provide radar control over the federal airways. The radar system operates on a simple echo principal. The radar facility transmits a high-energy radio signal which strikes an object, such as an aircraft in flight, and is reflected back to the radar antenna. The returned signal is visually displayed on a cathode ray tube at the control center. This display indicates the distance and azimuth from the radar antenna to the aircraft. The transponder is the airborne portion of the radar system. Radar beacons and transponders are capable of operating on 4,096 separate identification codes. Air Traffic Control assigns each aircraft that is using the radar service a separate code. By doing so, the transponder provides a distinct signal pattern on the radarscope and makes it possible for easy aircraft identification. This radar service is primarily for the control of IFR aircraft although the facilities do provide traffic information and limited vectoring to VFR aircraft when the IFR workload permits. In addition to the radar service provided by the Air Route Traffic Control Centers, terminal radar service is provided at 2 of Montana's airports: Billings and Great Falls. In these cases, the radar is used by the tower, approach control, and departure control for the separation of traffic within a 20 nautical mile radius of the terminal.

Airway Beacons: The Montana Aeronautics Division maintains a series of airway beacons located in the mountains of western Montana. These beacons have been strategically located along the more heavily traveled mountain corridors to assist VFR navigation during night-time

hours. The flashing beacons are typically located in high terrain thereby providing aircraft with a location check and helping identify the mountainous areas. In addition to being a navigational aid, the airway beacons also provide night-time pilots with a visibility check. The location of the 18 airway beacons in Montana are shown in Figure II.3.

Terminal Area Navaids: A variety of navigational aids are used to assist aircraft when approaching and landing at an airport. Obviously, the terminal radar service discussed earlier in this section provides the best navigational assistance and aircraft separation within the terminal area. The other forms of terminal navaids used to assist landing aircraft are: visual glide slope indicators, runway end identification lights, medium-intensity approach lighting systems, and instrument landing systems. The navaids available at each of Montana's airports are listed on the individual airport plates shown in Appendix C.

3. Enroute Airspace System

The civilian Enroute Airspace System is a network of three airway or route systems. These systems include the very high frequency omnidirectional range (VOR) airways, jet airways, and area navigation (RNAV) routes. Although the jet airways and area navigation routes are part of the airspace structure, their elevations are so great that they do not directly interact with the state's airports. Therefore, these routes were not considered in the airspace analysis. Attention was focused on the low-altitude, VOR airway system that directly affects operations at Montana's public-use airports.

The VOR airways are based solely on the availability of VOR/VORTAC/VOR-DME radio navigation facilities and are depicted on aeronautical charts by the designation of "V" (Victor) followed by the airway number. Figure II.4 presents the Victor Airway System in Montana.

Air traffic control over these Victor Airways is provided by three separate Air Route Traffic Control Centers (ARTCC). Each center controls a separate portion of the state as shown on Figure II.4. The Salt Lake City ARTCC controls the majority of the state. The Enroute Airways in the extreme northwest and southeast portions of Montana are controlled by the Seattle and Denver ARTCC's, respectively.

In order to receive the services provided by the ARTCC, a pilot need only file a flight plan outlining the details of the intended flight with a Flight Service Station. Since flight plans are not required for Visual Flight Rule (VFR) flights, there are usually aircraft operating over the airway networks whose identity is unknown to controllers.

Discussions with ARTCC officials revealed that the State of Montana is divided into three monitored sectors, all of which are experiencing no delay or potential problems with the existing enroute IFR system. One concern identified by ARTCC officials was the routing of aircraft through the several mountain ranges in the western portion of the state. Although this matter is primarily a safety concern of

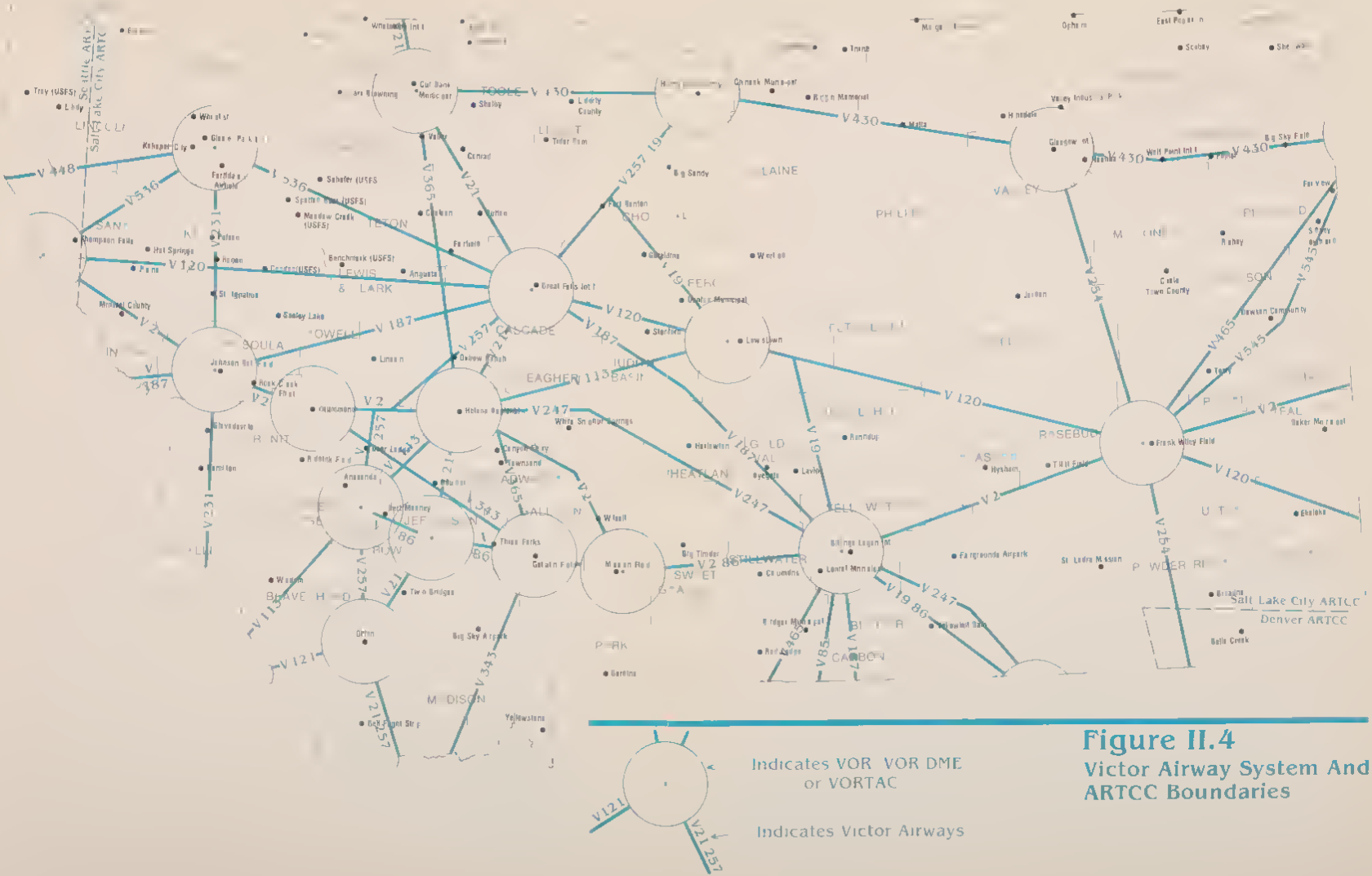


Figure II.4
Victor Airway System And ARTCC Boundaries

ARTCC officials, it does not pose an immediate problem to the overall Enroute Airspace System capacity.

FAA officials indicate there are no significant problems anticipated with the existing and future capacity of the Montana Air Traffic Control System.

The military also has an Enroute Airspace System which is comprised of a series of military training routes (MTR) throughout the state. Military training along these routes is generally concentrated below 10,000 feet MSL at speeds that exceed 250 knots. The military training routes are classified as either instrument routes (IR) where instrument flight rules are in effect or visual routes (VR) where visual flight rules apply. All MTR's in Montana are instrument routes. These routes are further classified according to the altitude where the operations take place. Low-level routes are those where the training activities are conducted exclusively at or below 1,500 feet above ground level. High-level routes are those with some route segments above 1,500 feet AGL. All of the MTR's in Montana are classified as high-level routes. Figure II.5 shows the location of the MTR's in Montana (Note that the majority of the MTR's are located above sparsely populated areas in the eastern and central portions of the state).

4. Terminal Airspace System

The Terminal Airspace System is composed of all facilities, equipment, and personnel in the near-airport area required to safely guide an aircraft to and from designated airways to terminal area flight landing and takeoffs. This is accomplished through approach and departure control facilities at the busier airports in the state. There are four such facilities in the State of Montana: Billings-Logan International Airport, Great Falls International Airport, Helena Regional Airport, and Johnson-Bell Field in Missoula.

Two aspects of terminal airspace that have an effect on the development of the system plan for the state include:

- Instrument Flight Rule (IFR) terminal airspace
- Visual Flight Rule (VFR) terminal airspace.

The purpose of designating IFR and VFR airspace areas is to identify overlaps between the operational areas of adjacent airports that may limit capacity and to establish guidelines in planning future facilities. The following factors influence the size, capacity, and configuration of terminal airspace areas:

Figure II.5
Military Operations Areas (MOA) and Military training Routes (MTR)

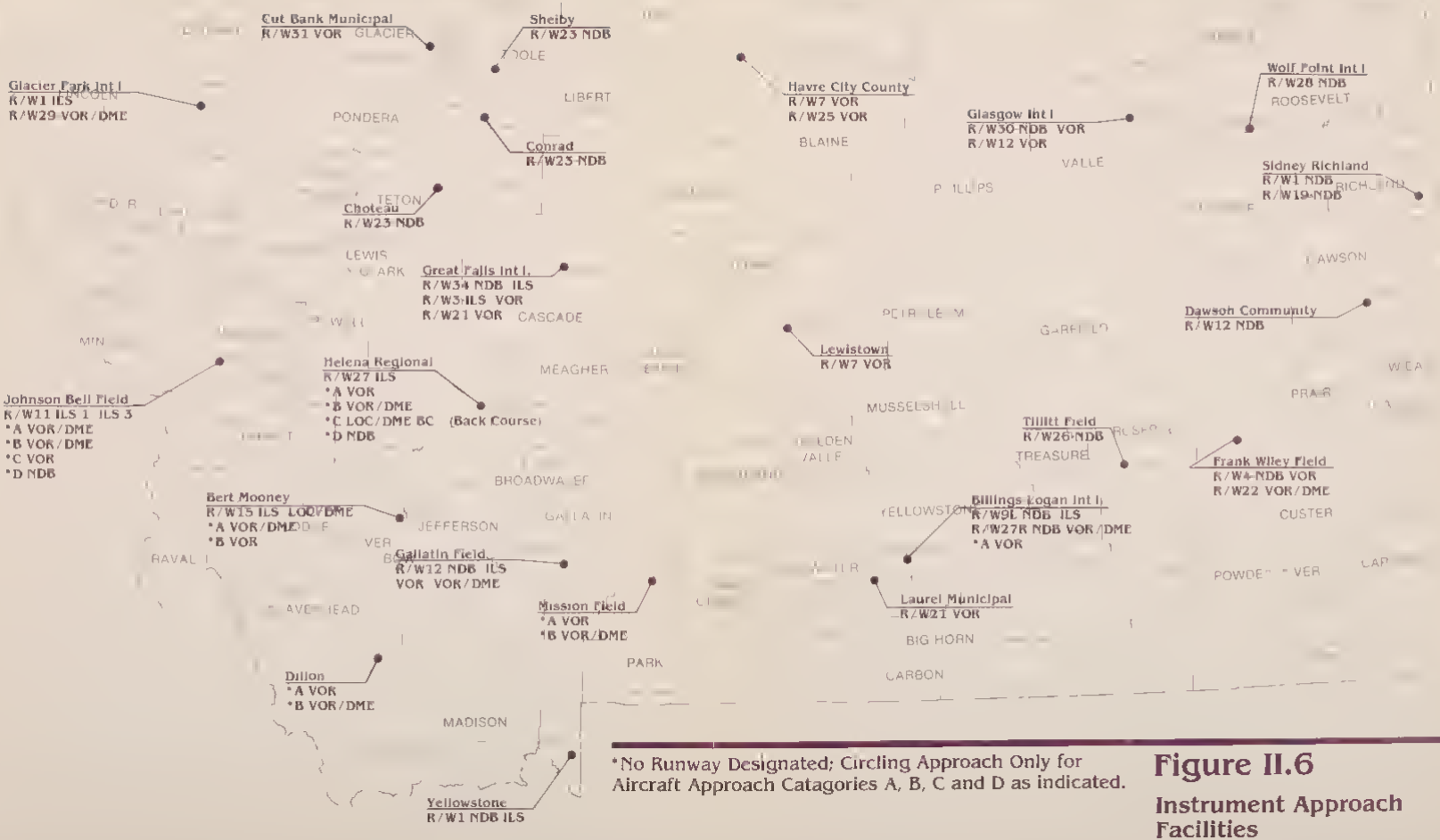
- Airport size
- Airport runway(s) configuration
- Air traffic volume
- Aircraft types
- Noise abatement procedures
- Obstructions
- Interaction with neighboring airports
- Navigational aids.
- Instrument approach patterns

The terminal VFR and IFR areas in Montana are designated using the methodologies developed by the FAA.[1] The VFR airspace areas correspond to the airport traffic patterns and provide the necessary airspace for VFR approaches and departures.

The IFR airspace areas provide for various instrument approaches to each airport. These IFR approach patterns determine, for the most part, the configuration of the IFR airspace area. Figure II.6 lists the existing instrument approach facilities in the state. For more information concerning the instrument approach patterns at each airport in Montana, refer to the instrument plates contained in the Instrument Approach Procedures Manual published by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

Ideally, there should be no overlaps in the VFR or the IFR airspace areas. The existence of overlapping areas does not necessarily suggest that operations are constrained or conditions are unsafe. There are currently no overlaps in the VFR airspace areas and only three in the IFR airspace areas. The IFR overlaps exist between Billings-Logan International Airport and Laurel Municipal Airport and between the Shelby and Cut Bank Airports and Shelby and Conrad Airports.

Air traffic control in the Billings-Laurel area is provided by the Billings Terminal Radar Service. The Billings Air Traffic Control[2] indicated that, although there is an IFR airspace overlap between Billings and Laurel, the overlap does not present a safety or capacity problem at this time. The Billings ATC provides routing and aircraft separation for instrument approaches and departures for both airports. The small amount of instrument activity at the Laurel Airport does not present a control or spacing problem for the Billings traffic. The Billings ATC does not anticipate any adverse impacts resulting from the IFR overlap for the foreseeable future. The overlap could cause a capacity problem for the Billings traffic if the IFR activity at Laurel was to increase significantly. That level of increased traffic is not anticipated to occur during the 20-year planning period of this study.



*No Runway Designated; Circling Approach Only for Aircraft Approach Catagories A, B, C and D as indicated.

Figure II.6

Instrument Approach Facilities

Air traffic control in the Cut Bank-Shelby-Conrad area is provided by the Salt Lake City Air Route Traffic Control Center. An airspace procedures specialist[3] was contacted at the Center with regard to the IFR overlaps between Shelby and Cut Bank and between Shelby and Conrad. The airspace specialist indicated that the very low volumes of instrument operations at the 3 airports cause no problems with respect to routing or spacing. The controllers are well versed in the procedures necessary to provide adequate aircraft spacing in overlapping airspace situations. Rarely is it necessary to place an aircraft in a holding pattern while another aircraft at an adjacent airport completes an instrument procedure. The Control Center does not anticipate any IFR capacity limitations in the future at Cut Bank, Shelby, or Conrad based on the forecast activity levels.

C. AERONAUTICAL ACTIVITY

This section of the plan presents historical and current aviation activity levels within the State of Montana. This information serves as the basis for evaluating existing airport capacities, forecasting future aviation demands, and identifying additional aviation system requirements. The following narrative examined three categories of aviation in Montana: the air carrier activity, general aviation activity, and military aviation activity.

1. Air Carrier Activity

Air carrier activity in Montana is evaluated by an examination of passenger enplanements, aircraft operations, instrument approaches, and enplaned cargo service. Air carrier activity is generated through operations performed in revenue service by scheduled and non-scheduled flights serving Montana. Included in this operational category are scheduled flights, chartered flights, diverted flights, and ferry operations.

a. Passenger Enplanements

A passenger enplanement is defined as a revenue passenger boarding either a scheduled or non-scheduled service aircraft. A review of historic enplanement data for airports with scheduled air service provides an indication of the growth of the airline industry in Montana.

Currently, fifteen airports in Montana receive scheduled air service. Seven of the fifteen airports receive service from certified route air carriers and commuter airlines while the remainder are served exclusively by commuters. The airports served by major air carriers and commuter airlines include the following:

- Bert Mooney/Butte
- Billings-Logan International
- Gallatin Field/Bozeman
- Glacier Park International/Kalispell
- Great Falls International
- Helena Regional
- Johnson-Bell Field/Missoula

The Montana Airports served only by commuter airlines include:

- Dawson Community/Glendive
- Frank Wiley Field/Miles City
- Glasgow International
- Havre-City-County
- Lewistown Municipal
- Sidney-Richland
- Wolf Point International
- Yellowstone/West Yellowstone

Table II.1 presents passenger enplanement data for each state airport receiving scheduled air service over the past six years. This information was obtained from the U.S. Department of Transportation's "DOT/TSC ACIS Database, U.S. Airport Enplanement Activity for Calendar years 1981-1986." The enplanement totals include those for certificated route air carriers, commuters, air taxi/commercial, and other individual carriers as appropriate for each airport.

TABLE II.1

PASSENGER ENPLANEMENTS FOR MONTANA'S SCHEDULED AIR SERVICE AIRPORTS[1]

AIRPORT/CITY	1981	1982	1983	1984	1985	1986	1986 RANK
Bert Mooney/Butte	31,758	31,221	34,935	35,311	41,704	28,086	7
Billings-Logan Int'l./Billings	311,907	352,638	347,689	322,190	333,330	324,514	1
Dawson Community/Glendive	1,484	1,361	1,119	1,200(E)	1,400(E)	1,532	13
Frank Wiley Field/Miles City*	1,181	695	872	1,100(E)	1,400(E)	1,697	12
Gallatin Field/Bozeman[2]	62,819	61,103	72,395	73,680	80,735	105,197	4
Glacier Park Int'l./Kalispell	36,597	41,017	56,343	52,837	55,554	55,210'	5
Glasgow Int'l./Glasgow*	2,445	2,091	1,586	3,628	2,876	2,555	10
Great Falls Int'l./Great Falls	106,161	137,267	145,834	129,619	133,243	148,561	2
Havre City-County/Havre*	878	1,046	1,146	1,000(E)	1,000(E)	900(E)	14
Helena Regional/Helena	47,294	57,305	58,205	58,605	57,138	49,920	6
Johnson-Bell Field/Missoula	89,735	102,513	114,212	121,110	119,717	131,180	3
Lewistown Municipal/Lewistown*	506	503	486	500(E)	500(E)	500(E)	15
Sidney-Richland Municipal/Sidney*	3,090	2,844	2,194	3,765	4,885	7,662	8
Wolf Point Int'l./Wolf Point*	1,979	1,685	2,532	2,545	2,100(E)	1,808	11
Yellowstone/West Yellowstone	4,854	5,535	6,874	3,553	2,660	2,796	9

1 Enplanement totals include those for certificated route carriers, commuters, air taxi/commercial operators, and other individual air carriers as appropriate for each airport.

2 Enplanements for Gallatin Field were adjusted based on information contained in a Gallatin Field press release dated January 2, 1987.

(E) Enplanement totals were estimated where actual data was missing or unreported.

* Denotes airports receiving Essential Air Service subsidies and are served exclusively by commuter airlines.

Source: U.S. Department of Transportation, "DOT/TSC ACIS Database, U.S. Airport Enplanement Activity, 1981-1986 Calendar years."

The table indicates that total enplanements have increased significantly over the past six years at Billings-Logan International Airport, Gallatin Field, Glacier Park International Airport, Great Falls International Airport, Sidney-Richland Municipal Airport, and at Johnson-Bell Field. Total enplanements at the remainder of the scheduled air service airports in Montana have remained relatively constant over

the period. Billings-Logan International has had far more passenger enplanements than any other state airport. The 1986 passenger enplanement totals for Gallatin Field show a more than 30% increase over its 1985 total enplanements.

TABLE II.2

ANNUAL AIR CARRIER OPERATIONS

Airport/City	Air Carrier Operations	Air-Taxi/ Commuter Operations	Total Air Carrier Operations	Source/Date
Bert Mooney/Butte	1,095	6,829	7,924	FAA 5010/7-3-86
Billings-Logan Int'l./Billings	16,292	19,744	36,036	FAA Air Traffic Activity, FY 1986
Dawson Community/Glendive	0	1,518	1,518	FAA 5010/1-14-86
Frank Wiley Field/Miles City	0	3,000	3,000	FAA 5010/12-6-85
Gallatin Field/Bozeman	6,570	3,000	9,750	FAA 5010/7-3-86
Glacier Park Int'l./Kalispell	2,680	4,180	6,860	FAA 5010/7-1--86
Glasgow Int'l./Glasgow	0	3,000	3,000	FAA 5010/5-22-86
Great Falls Int'l./Great Falls	10,645	6,953	17,598	FAA Air Traffic Activity, FA 1986
Havre City-County/Havre	0	2,400	2,400	FAA 5010/7-14-86
Helena Regional/Helena	2,740	9,774	12,514	FAA Air Traffic Activity, FA 1986
Johnson Bell Field/Missoula	6,131	5,551	11,682	FAA Air Traffic Activity, FY 1986
Lewistown Municipal/Lewistown	0	1,466	1,466	FAA 5010/3-11-86
Sidney-Richland Municipal/Sidney	0	7,313	7,313	FAA 5010/1-14-86
Wolf Point Int'l./Wolf Point	0	3,160	3,160	FAA 5010/1-22-86
Yellowstone/West Yellowstone	566	300	866	FAA 5010/9-10-85

b. Annual Operations

Data concerning annual operations by air carriers in Montana is available from several sources including airport Master Plans, the FAA's Air Traffic Activity Summaries for Various Fiscal Years, and the FAA Form 5010-1, Airport Master Records. Table II.2 contains the most recent information on the number of annual operations for air carriers and air-taxi/commuters for Montana's air carrier airports.

It should be noted that the total annual air carrier operations for Gallatin Field shown in the above table are actual 1984 operations. The most recent form for Gallatin

Field (10-7-86) showed 9,570 air-taxi/commuter operations but no totals for air carrier operations. Therefore, the table shows the number of air carrier operations contained in the "mini-update" of the Airport Master Plan for Gallatin Field.

TABLE II.3

HISTORICAL AIRLINE PEAK HOUR PERCENTAGES FOR MONTANA'S SCHEDULED AIR SERVICE AIRPORTS

Airport/City	Percent	Percent	Percent
Bert Mooney/Butte	22.2	16.7	10.0
Billings-Logan Int'l./Billings	14.9	15.5	19.0
Dawson Community/Glendive	50.0	50.0	50.0
Frank Wiley Field/Miles City	33.3	33.3	33.3
Gallatin Field/Bozeman	18.2	20.0	16.7
Glacier Park Int'l./Kalispell	12.5	25.0	25.0
Glasgow Int'l./Glasgow	33.3	33.3	33.3
Great Falls Int'l./Great Falls	10.5	12.5	16.7
Havre City-County/Havre	50.0	50.0	50.0
Helena Regional/Helena	25.0	20.0	15.4
Johnson-Bell Field/Missoula	23.1	22.5	21.4
Lewistown Municipal/Lewistown	25.0	25.0	40.0
Sidney-Richland Municipal/Sidney	25.0	25.0	24.0
Wolf Point Int'l./Wolf Point	33.3	33.3	50.0
Yellowstone/West Yellowstone	33.3	33.3	50.0

c. Peak Hour Operations

Peak hour operations are defined as the one-hour period within which the level of operations are higher than any other one-hour period during the year. The identification of the peak hour period is easier for airline operations than for general aviation operations since airlines must publish their schedules and are bound by them, while general aviation operations are not restricted to published schedules.

Examination of air carrier schedules in the Official Airline Guide (OAG) reveals that summer months are traditionally the peak months of the year. Airline operations in August are greater than or equal to any other month of the year. Peak period characteristics for each air carrier airport in Montana were identified using airline

schedules from the August 1984, 1985 and 1986 OAG. Peaking characteristics were expressed in terms of the peak hour as a percentage of the average day of the peak month. These percentages are presented in Table II.3 above.

d. Instrument Approaches

Instrument approaches consist of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a point from which a landing can be made visually. An instrument approach occurs when an FAA-operated terminal control facility handles the arrival of an aircraft in accordance with an IFR flight plan or provides IFR separation between other aircraft. Information concerning instrument approaches was obtained from the Federal Aviation Administration's Air Traffic Activity reports for recent fiscal years. Based on this information, historical data on instrument approaches at Montana's scheduled air service airports is presented in the Table II.4. The instrument approach totals include those for air carriers and air-taxi aircraft.

TABLE II.4

INSTRUMENT APPROACHES AT MONTANA'S SCHEDULED AIR SERVICE AIRPORTS (1982 - 1986)[1]

Airport/City	1982 Air Carrier	1982 Air Taxi	1982 Total	1983 Air Carrier	1983 Air Taxi	1983 Total	1984 Air Carrier	1984 Air Taxi	1984 Total	1985 Air Carrier	1985 Air Taxi	1985 Total	1986 Air Carrier	1986 Air Taxi	1986 Total	1986 %Instrument Approaches
Bert Mooney/Butte	72	49	121	44	53	97	0	4	4	27	10	37	29	11	40	0.505[2]
Billings Logan Int'l./Billings	956	752	1078	772	602	1374	624	604	1228	772	810	1582	962	1162	2124	5.894
Dawson Community/Glendive	1	82	83	0	36	36	36	0	16	0	15	15	0	40	40	2.635[2]
Frank Wiley Field/Miles City	27	116	143	1	55	56	0	37	37	0	16	16	0	34	34	1.133[2]
Gallatin Field/Bozeman	44	19	63	70	19	89	6	5	11	26	3	29	36	14	50	0.769[3]
Glacier Park Int'l./Kalispell	72	19	91	12	10	22	33	18	51	30	11	41	47	22	69	1.006[2]
Glasgow Int'l./Glasgow	0	95	95	3	66	69	0	42	42	0	12	12	0	21	21	0.700[2]
Great Falls Int'l./Great Falls	516	346	862	332	89	421	433	162	595	447	197	644	538	379	917	5.211
Havre City-County/Havre	11	26	37	3	18	21	0	0	0	0	11	11	0	0	0	0.000[2]
Helena Regional/Helena	397	201	598	393	144	537	679	386	1065	372	830	1202	353	1072	1425	11.387
Johnson-Bell Field/Missoula	1258	215	1473	1190	192	1382	1504	181	1685	1627	377	2004	1313	648	1961	16.787
Lewistown Municipal/Lewistown	16	43	59	17	20	37	0	12	12	0	9	9	0	11	11	0.750[2]
Sidney-Richland Muni./Sidney	0	104	104	0	60	60	0	9	9	0	9	9	0	27	27	0.369[2]
Wolf Point Int'l./Wolf Point	7	68	75	0	65	65	0	22	22	0	11	11	0	29	29	0.918[2]
Yellowstone/W.Yellowstone	54	36	90	9	9	18	2	0	2	3	1	4	4	0	4	0.462[2]

1 FAA, Air Traffic Acvitity, respective fiscal years. These figures include only completed instrument approaches and underestimate actual instrument approach use.

2 Percent instrument approaches based on number of air-carrier and air-taxi operations shown on most recent FAA 5010-1, Airport Master Record for each airport.

3 Existing Airport Master Plan Mini-Update, January, 1985.

Air Carriers hold a Certificate of Public Convenience and Necessity issued by the Civil Aeronautics Board to conduct scheduled services over specified routes and a limited amount of non-scheduled operations.

Air Taxis are air taxi operations which: (1) perform at least five round trips per week between two or more ponts and provide flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service.

Source: FAA Air Traffic Activity Reports, respective fiscal years.

The instrument activity levels tabulated by the FAA reflect only completed instrument landings. This data grossly understates the actual amount of instrument activity at an airport. It is common practice for a pilot to cancel an IFR flight plan when the destination runway is in sight. This often occurs in the traffic pattern or on final approach. Since the landing was actually VFR, the FAA does not record this operation as IFR even though instrument approach procedures and facilities were used. As a result, the FAA data does not present an accurate account of the instrument activity at an airport. This discrepancy is most notable at non-towered airports such as Bozeman and Butte. Because of these reporting procedures, it is difficult to assess the need for new instrument approach facilities using FAA data.

e. Air Cargo

Records of enplaned air cargo tonnages at Montana's air carrier airports is available from two published sources: existing airport Master Plans, and the Federal Aviation Administration's Airport Activity Statistics of Certificated Route Air Carriers. Additionally, air cargo information was requested from Northwest Airlink, Federal Express, United Parcel Service, and Purolater. Where the published reports did not provide enplaned air cargo information (typically for essential air-service points), a consultant estimate of enplaned cargo and mail per departure was assumed. Northwest Airlink representatives did not have air cargo information broken down by airport but indicated that 20 pounds of air cargo and mail per flight was a reasonable estimate for Montana. None of the other carriers would release information concerning their cargo activity because it is proprietary information. Therefore, the estimate of 20 pounds of cargo per departure was used in the absence of other data.

Table II.5 presents enplaned air cargo tonnages for the 15 air carrier airports in Montana during 1985.

TABLE II.5

ENPLANED AIR CARGO TONNAGE FOR 1985
AT MONTANA'S SCHEDULED AIR SERVICE AIRPORTS

Airport/City	1985 Tonnage
Bert Mooney/Butte[1]	915.0
Billings-Logan Int'l./Billings[1]	2717.0
Dawson Community/Glendive[2]	7.6
Frank Wiley Field/Miles City[2]	15.0
Gallatin Field/Bozeman[2]	151.4
Glacier Park Int'l./Kalispell[3]	179.5
Glasgow Int'l./Glasgow[3]	15.0
Great Falls Int'l./Great Falls[3]	482.9
Havre City-County/Havre[2]	12.0
Helena Regional/Helena[3]	214.4
Johnson-Bell Field/Missoula[4]	869.0
Lewistown Municipal/Lewistown[2]	7.3
Sidney-Richland Municipal/Sidney[2]	36.6
Wolf Point Int'l./Wolf Point[2]	15.8
Yellowstone/West Yellowstone[3]	0.4

1 Estimate provided by Airport Manager.

2 Consultant estimates based on assumption that 20 pounds of air cargo was enplaned for each departure.

3 Federal Aviation Administration, Airport Activity Statistics of Certificate Route Air Carriers, U.S. Department of Transportation, 1986.

4 Estimate from Master Plan.

Note: Air cargo includes all freight, express, and U.S. mail enplaned at the airport.

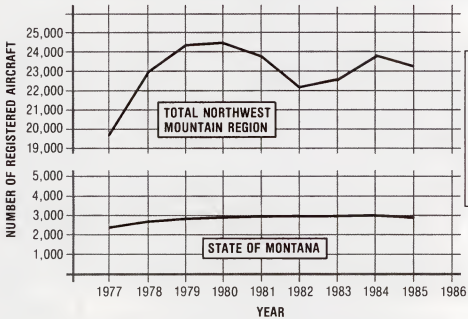
2. General Aviation Activity

General aviation is defined as all civil aircraft operations not classified as air carrier, air-taxi, or commuter operations. This classification of aircraft operations includes flying for pleasure, business, or training in single-engine, fixed-wing or rotocraft aircraft. An evaluation of several elements of historical general aviation demand in Montana provides a basis for estimating future activity. The elements that are examined are registered aircraft, based aircraft, fleet mixes, annual aircraft operations, enplanements, and instrument approaches. Each of these items is discussed in the following sections.

a. Registered Aircraft

A registered aircraft is defined as either fixed or rotary wing, operated in non-airline service with a current registration. Historical information on registered aircraft is compiled by the FAA and published in the Census of U.S. Civil Aircraft. This document is published for each fiscal year and contains registered aircraft counts for each county in the United States. Figure II.7 shows the historical trend in registered aircraft for the State of Montana and the FAA's Northwest Mountain Region (Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming).

Figure II.7
Historical Registered Aircraft Counts For Region And State



Year	Total NW Mountain Region	Montana
1977	19,700	2,417
1978	23,000	2,647
1979	24,400	2,836
1980	24,500	2,884
1981	23,800	2,932
1982	22,100	2,952
1983	22,500	2,976
1984	23,800	3,001
1985	23,300	2,940

SOURCE: Federal Aviation Administration, Census of U.S. Civil Aircraft, Washington D.C., U.S. Dept. of Transportation, respective years

It is apparent from the Figure that the number of registered aircraft in Montana has remained almost constant at about 3,000 aircraft since 1980.

b. Based Aircraft

By definition, a based aircraft is a general aviation aircraft that is stationed at an airport on a permanent basis. Information on based aircraft is collected annually for each airport under the Facility Records Inspection Program by the FAA and the Montana Aeronautics Division under contract to the FAA. The FAA's Form 5010 is used to record based-aircraft and operational data at each of Montana's airports.

Current 5010 records were reviewed and updated during the airport inventory phase to determine the number of based aircraft at each public-use airport in the state. This information is contained in Appendix B. As shown in the appendix, there are currently 2,034 based aircraft at the 114 public use airports included in this study. The largest numbers of based aircraft are located in the Flathead, Gallatin, Missoula, Lewis and Clark, Ravalli, and Cascade counties.

c. Aircraft Fleet Mix

Aircraft fleet mix refers to the characteristics of a group of aircraft. General aviation aircraft are classified with respect to physical characteristics such as aircraft identification, fixed-wing or rotorcraft, aircraft weight, and number and type of engines. Aircraft with dissimilar physical and operational characteristics require varying types and sizes of airport facilities. These facilities include runway length and strength, fuel types, and aircraft parking and storage facilities. Additionally, airport operating procedures, such as noise abatement measures, may be influenced by the aircraft fleet mix.

TABLE II.6

HISTORICAL GENERAL AVIATION FLEET MIX FOR AIRCRAFT BASED IN MONTANA

Year	Single-Engine	Multi-Engine	Turbo-prop	Turbo-jet	Roto-craft	Other	Total
1977:							
Montana	87.22%	8.32%	0.62%	0.70%	2.32%	0.83%	100.00%
U.S.	81.01%	11.67%	1.57%	1.25%	2.60%	1.90%	100.00%
1981:							
Montana	84.64%	9.15%	0.99%	0.82%	3.48%	0.92%	100.00%
U.S.	78.72%	11.95%	2.20%	1.50%	3.28%	2.34%	100.00%
1984:							
Montana	84.61%	8.30%	1.56%	0.88%	3.64%	1.19%	100.00%
U.S.	77.82%	11.54%	2.63%	1.95%	3.21%	2.85%	100.00%
1985							
Montana:	84.42%	8.30%	1.56%	0.88%	3.64%	1.19%	100.00%
U.S. (Estimate)	76.86%	11.82%	2.82%	2.12%	3.42%	2.96%	100.00%

All general aviation aircraft can be classified as either single-engine piston, multiple-engine piston, turbo-prop, turbo-jet/turbo-fan, rotorcraft, or other types of aircraft. These same categories were used to identify the various types of registered aircraft in Montana counties. Historical information on registered aircraft types for the State of Montana contained in the FAA's Census of U.S. Civil Aircraft was reviewed to determine the statewide fleet mix for registered aircraft. This data is presented in Table II.6.

Due to the significant impact that varying aircraft types place on individual airports and airport systems, based-aircraft fleet mixes for individual airports were also tabulated. Fleet mix is discussed in Chapter III and shown for each airport in Table III.5.

d. Annual Operations

Accurate records of general aviation (GA) activity for the majority of the airports in Montana are not available. The most reliable source of activity data has been the FAA Form 5010-1 "Airport Master Records," but even these include "best guess" figures which may in some cases be overly optimistic. Because of this potential inaccuracy, ramp surveys were conducted at 14 airports around the state to generate a more accurate general aviation data base. The airports surveyed were identified in the previous chapter, Figure I.1 , and include the following:

- Chinook Municipal
- Dawson Community
- Dillon
- Gallatin Field
- Hamilton
- Laurel Municipal
- Libby
- Scobey
- Seeley Lake
- Shelby
- Sidney-Richland Mun.
- Stanford
- Tillitt Field
- Yellowstone

These airports were selected because of size, number of fixed-base aircraft, and geographic location in an attempt to gather representative data for airports of varying sizes and locations.

Each ramp survey consisted of 30 hours of data collection taken over a three-day period. Thirteen surveys were conducted in August of 1987, and one in September of 1987. Survey information collected at each airport included the total, local, and itinerant operations; fleet-mix, purpose of flight (business, pleasure, or both); occupancy; and type of flight (commercial, agricultural spraying, flight instruction, military, and others). The tabulated results of the ramp surveys are shown in Table II.7.

TABLE II.7

RAMP SURVEY RESULTS
(30 HRS. OF DATA COLLECTION OVER 3-DAY TIME PERIOD)

Airport Name	Based Aircraft	General Aviation Operations			Fleet-Mix (GA Operations)			Purpose of Flight (GA Operations)			GA	No. of Occupants
		Total	Local	Itinerant	SEP	MEP	MEJ	Business	Pleasure	Both	Take-offs	per Take-Off
Gallatin Field	115	259	141	118	236	17	6	119	137	3	87	178
Sidney-Richland	61	30	8	22	26	4	-	24	6	-	13	21
Laurel	61	92	65	27	91	1	-	15	67	10	15	24
Hamilton	50	138	100	38	138	-	-	97	41	-	34	41
Dawson Community	29	19	3	16	15	4	-	15	2	2	7	18
Chinook Municipal	29	30	10	20	30	-	-	15	15	-	15	26
Tillitt Field	23	144	120	24	142	2	-	16	85	44	27	44
Shelby	21	40	18	22	40	-	-	32	6	2	18	29
Libby	17	49	10	39	37	10	2	36	13	-	22	50
Scobey	14	14	6	8	14	-	-	14	-	-	6	9
Dillon	12	104	49	55	64	40	-	84	17	2	46	91
Stanford	8	29	16	13	29	-	-	14	15	-	14	20
Yellowstone	3	46	10	36	36	8	2	21	23	2	23	72
Seeley Lake	2	17	6	11	15	2	-	7	10	-	8	17
Totals:	445	1011	562	449	913	88	10	510	436	65	335	640
% of Total:		100.0%	55.6%	44.4%	90.3%	8.7%	1.0%	50.4%	43.2%	6.4%		

SEP = Single-Engine Propeller
MEP = Multi-Engine Prpeller
MEJ = Multi-Jet Engine

The survey results contained in Table II.7 show that during the survey period:

- Airplane occupancy was 1.91 people per plane counted at take-off.
- 55.7% of the GA operations surveyed were local flights.
- 44.3% of the GA operations surveyed were itinerant flights.
- 90.3% of the operations were performed by single-engine propeller aircraft.
- 8.7% of the operations were performed by multi-engine propeller aircraft.
- 1.0% of the operations were performed by multi-engine jet aircraft.
- 50.4% of the flights were business-related.
- 43.2% of the flights were conducted for pleasure flying.
- 6.4% of the flights were both pleasure and business-related.
- The average number of GA enplanements was 1.91 per departure.

Further analysis of the ramp survey results indicated that the number of operations recorded at each site was greatly affected by the presence of agricultural aerial applicators and/or flight instructors at the airport. When either of these businesses

was present, there was an increase in the number of GA operations per based aircraft compared to airports lacking these businesses. As a means of generating reliable existing GA operational data for Montana's airports, it was felt appropriate to develop initially a "base" number of GA operations per based aircraft for each airport. This "base" figure was adjusted for those airports which have aerial applicators and/or flight instructors located on the field. Conversations with several aerial applicators and flight instructors in Montana indicated that the average annual operations performed by each was 200 and 150 operations, respectively. A retabulation of the ramp survey results showing separate totals for flight instruction and agricultural spraying operations is presented in Table II.8.

TABLE II.8

RAMP SURVEY RESULTS (RETABULATION)
GENERAL AVIATION OPERATIONS

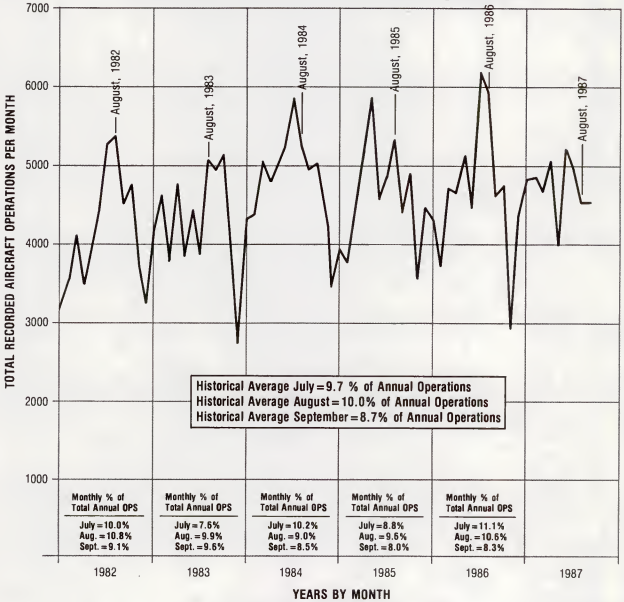
Airport Name	Based Aircraft	Local Operations	Itinerant Operations	Flight Instruction Operations	Agricultural Spraying Operations	Total Operations
Gallatin Field	115	77	116	64	2	259
Sidney-Richland	61	4	22	4	-	30
Laurel	61	4	27	56	5	92
Hamilton	50	34	38	66	-	138
Dawson Community	29	1	16	-	2	19
Chinook Municipal	29	6	20	0	4	30
Tillitt Field	23	24	24	88	8	144
Shelby	21	5	22	2	11	40
Libby	17	6	39	4	-	49
Scobey	14	6	8	-	-	14
Dillon	12	11	55	8	30	104
Stanford	8	2	13	-	14	29
Yellowstone	3	6	36	4	-	46
Seeley Lake	2	6	11	-	-	17
Totals	445	192	447	296	76	1011

In order to generate existing "annual" general aviation operations for each system airport, the 30 hours of survey data presented in Table II.8 was adjusted to represent annual operations. This adjustment was accomplished in two steps. The ramp survey data was first converted into monthly operations, and then adjusted to annual operations. Surveyed operations were adjusted to a monthly figure by applying a factor based on operations at the Helena Airport. The factor was derived by

comparing the activity level at the Helena Airport during the survey period with the monthly activity at the Helena Airport. This factor was then applied to the surveyed data to estimate the monthly activity.

Monthly operations were adjusted to annual operations using a similar technique. Monthly traffic records for the years 1982 through 1987 were obtained from the Control Tower at Helena Regional Airport and plotted as shown in Figure II.8.

Figure II.8
Monthly Fluctuation In Airport Operations



SOURCE: Helena Airport Control Tower FAA Form 1700-2

Historically, monthly operations at Helena during July, August and September accounted for 9.7%, 10.0% and 8.7%, respectively, of the airport's annual operations. Assuming these historical monthly percentages at Helena are similar to the operations at other state airports, the monthly operations for each airport surveyed were adjusted accordingly to obtain estimates of annual GA operations. Annual operations were increased to account for nighttime GA operations, since the ramp surveys were only conducted during daylight hours. Annual operations were increased by 5%, based on an estimate of nighttime operations from personnel at the Helena Regional Airport Control Tower.

TABLE II.9

ADJUSTED ANNUAL GA OPERATIONS FOR THE RAMP SURVEY AIRPORTS

Airport Name	Based Aircraft	*Adjusted Total Annual GA Operations
Gallatin Field	115	15,710
Sidney-Richland	61	2,650
Laurel	61	4,590
Hamilton	50	7,200
Dawson Community	29	1,760
Chinook Municipal	29	4,980
Tillitt Field	23	7,200
Shelby	21	3,180
Libby	17	7,180
Scobey	14	1,330
Dillon	12	10,360
Stanford	8	3,290
Yellowstone	3	6,780
Seeley Lake	2	1,390
Totals:	445	77,600

*Figures do not include agricultural spraying or flight instruction operations.

The adjusted annual GA operations and the number of based aircraft at each of the surveyed airports is shown in Table II.9. Analysis of this information indicates that each airport averages approximately 175 annual GA operations per based aircraft,

excluding operations by aerial applicators and/or flight instructors. Annual operations by each of these businesses (200 operations per aerial applicator and 150 operations per flight instructor) were added separately to the estimated annual GA operations. Graphing of the data illustrated that regardless of the number of base aircraft, about 1,000 operations per year occurred at each airport. Therefore, a base number of 1,000 annual operations was added to the formula used to calculate annual GA operations.

This information was used to develop the following formula which provides an estimated number of annual GA operations for Montana airports using number of aircraft, flight instructors, and aerial applicators as variables.

Estimated Annual GA Operations = 175 (No. of Based Aircraft) + 200 (No. of Active Aerial Applicators + 150 (No. of Active Flight Instructors) + 1000

An example of calculating the Estimated Annual GA Operations using this formula is shown below:

An airport has 30 based aircraft, 2 active aerial applicators, and 1 active flight instructor. The estimated number of annual GA operations at the airport would be:

Estimated Annual GA Operations = 175(30) + 200(2) + 150(1) + 1000 = 6,800

Based on the previously discussed ramp survey results for local and itinerant GA operations and enplanements, additional information for the example airport can be determined:

Local GA Operations = 55.6% x 6,800 = 3,780

Itinerant GA Operations = 44.4% x 6,800 = 3,020

GA Enplanements = 1.91 x (3,780 + 3020) /2 departures = 6,494

This methodology was employed to generate the estimated current number of annual GA operations for each airport in the state. The results of the calculations are presented in Appendix B.

e. Enplaned Passengers

Data on the number of general aviation enplaned passengers is useful in determining the size of landside facilities such as the terminal area, terminal building, and automobile parking area. However, this information is commonly ignored because of the lack of historical GA enplanement data. Currently, no government agency records actual GA enplanement figures. Therefore, estimates of enplaned passengers per itinerant GA departure were developed.

The Aircraft Owners and Pilots Association (AOPA) projected a factor of 2.96 passengers per itinerant GA departure in 1985. Subsequent analysis of the ramp survey data showed an enplanement figure of 1.91 passengers per itinerant GA departure at the 14 airports where surveys were completed. The 1.91 figure was used to forecast GA enplanements (Chapter III).

f. Instrument Approaches

Information regarding instrument approaches was tabulated using the FAA's Air Traffic reports and recently completed Airport Master Plans. An instrument approach occurs when an FAA-operated terminal control facility directs the arrival of an aircraft on an IFR flight plan or provides IFR separation to other aircraft. Table II.10 shows the historical relationship between total general aviation operations and total general aviation instrument approaches as recorded by the FAA.

It is common practice for pilots to cancel an IFR flight plan when the runway is in sight. This is done to aid the controllers in the spacing of following flights. If the IFR flight plan is canceled, the instrument activity is not recorded. As a result, the FAA instrument data grossly understates the actual amount of instrument activity at an airport. This discrepancy is most notable at non-towered airports such as Bozeman and Butte.

TABLE II.10

GENERAL AVIATION INSTRUMENT APPROACHES BY AIRPORT FY 1982-1986[1]

Airport/City	1982	1983	1984	1985	1986	1986 % Instrument Approaches
Billings-Logan Int'l./Billings	1364	972	836	764	107	1.454
Gallatin Field/Bozeman	59	60	42	26	26	0.085[2]
Bert Mooney/Butte	72	38	20	23	14	0.131[2]
Conrad	31	20	NA	3	12	0.171[2]
Cut Bank Municipal/Cut Bank	47	17	23	11	17	0.378[2]
Dillon	23	51	5	12	21	0.263[2]
Tillitt Field/Forsyth	NA	NA	NA	16	15	0.136[2]
Glasgow Int'l./Glasgow	86	55	15	13	20	0.059[2]
Dawson Community/Glendive	73	46	17	15	22	0.168[2]
Great Falls Int'l./Great Falls	706	409	278	368	315	0.939

TABLE II.10 (CONT.)

GENERAL AVIATION INSTRUMENT APPROACHES BY AIRPORT FY 1982-1986[1]

Airport/City	1982	1983	1984	1985	1986	1986 % Instrument Approaches
Havre City-County/Havre	38	13	3	9	19	0.073[2]
Helena Regional/Helena	483	333	664	555	536	1.570
Glacier Park Int'l./Kalispell	43	13	35	20	24	0.044[2]
Lewistown Municipal/Lewistown	54	10	6	14	15	0.075[2]
Mission Field/Livingston	65	10	19	17	18	0.212[2]
Frank Wiley Field/Miles City	92	68	37	30	26	0.104[2]
Johnson-Bell Field/Missoula	1008	705	822	875	848	2.000
Shelby	59	27	1	4	7	0.156[2]
Sidney-Richland Mun./Sidney	88	25	9	7	22	0.113[2]
Yellowstone/West Yellowstone	27	5	4	8	4	0.089[2]
Wolf Point Int'l./Wolf Point	77	31	7	14	19	0.185[2]

1 FAA, Air Traffic Activity, respective fiscal years. These figures include only completed instrument approaches and understate actual instrument approach use.

2 Percent GA instrument approaches based on the number of GA operations shown on most recent FAA 5010-1, Airport Master Record for each airport.

NA No information on the number of instrument approaches for the fiscal years.

3. Military Aviation Activity

Historic data on military operations at Montana's public-use airports is limited to two sources; the FAA's 5010-1, Airport Master Records and the FAA's Air Traffic Activity reports. The 5010-1 records contain a summary of annual operations at each airport which specifically categorizes military operations. The Air Traffic Activity reports contain data on both local and itinerant military operations; however, the data is collected only for the four airports with FAA-operated traffic control towers. The Air Traffic Activity reports also contain information on the number of instrument operations. Table II.11 shows the military activity at each system airport. Airports with no military activity were not listed. It should be noted that Montana's only Air Force Base is Malmstrom located in Great Falls. Because this System Plan is focusing on public-use airports, the activities occurring at Malmstrom AFB were considered outside the scope of the plan and, therefore, have not been included herein.

TABLE II.11

MILITARY AVIATION ACTIVITY[1]

County	Airport	Number of Operations	% instrument Approaches
Beaverhead	Dillon	250	
Broadwater	Canyon Ferry	150	
	Townsend	500	
Carbon	Red Lodge	100	
Cascade	Great Falls Int'l.	9,248[2]	2.476[2]
Dawson	Dawson Community	15	
Fergus	Lewistown Municipal	700	
Flathead	Kalispell City	100	
	Glacier Park Int'l.	50	
Gallatin	Gallatin Field	400	
	Yellowstone	20	
Glacier	Cut Bank Municipal	100	
Hill	Havre City-County	48	
Lewis & Clark	Benchmark	10	
	Helena Regional	10,023[2]	1.008[2]
	Lincoln	100	
	Oxbow Ranch	50	
Missoula	Johnson-Bell Field	262[2]	5.725[2]
Park	Mission Field	75	
Phillips	Malta	25	
Pondera	Conrad	20	
Powell	Deer Lodge City-County	600	
Prairie	Terry	30	
Roosevelt	Big Sky Field	30	
Rosebud	Tillitt Field	12	
Sheridan	Sher-Wood	10	
Silver Bow	Bert Mooney	244	
Valley	Glasgow Int'l.	100	
Wheatland	Harlowton	75	
Yellowstone	Billings-Logan Int'l.	882[2]	2.381[2]
Total State of Montana		22,229	

1 FAA 5010-1, Airport Master Records were the primary source of the military operations data. Exceptions are noted below.

2 FAA, Air Traffic Activity, FY 1986.

3 According to the Air Traffic Activity Records for FY 1986, only Billings-Logan Int'l., Great Falls Int'l., Helena Regional Airport, and Johnson-Bell recorded instrument approaches for military operations.

D. SURFACE TRANSPORTATION

Since many of Montana's airports are not located immediately adjacent to the communities they serve, surface transportation facilities and services are important to aviation activities in the state. Pilots and passengers utilize surface transportation systems to reach their true destinations. Therefore, the availability, condition, and performance of the ground transportation system is a vital element of the private and commercial aviation system in Montana.

The surface transportation system in Montana consists of roadways and railways. There is no significant waterway travel in Montana with the exception of auto-ferry service across the Missouri River at four rural locations. The following narrative discusses Montana's surface transportation network and available passenger and freight services.

1. Railways

The railway system in Montana is comprised of 2,392 miles of privately-owned trackage on two main routes across the state. The northern route follows the "highline" across Montana and connects Sand Point, Idaho with Bismarck, North Dakota via Kalispell, Havre, Glasgow, and Wolf Point. The southern route connects Sand Point, Idaho with Billings via Missoula, Butte, and Bozeman. The southern route includes three lines connecting the Billings area with Bismarck and Minneapolis-St. Paul; Sheridan, Wyoming and Omaha, Nebraska; and with Lovell, Wyoming and Denver, Colorado. Figure II.9 shows the major railroad lines in Montana.

Passenger rail service in Montana is available only on the northern route through the state. Amtrak's "Empire Builder" runs daily and provides eastbound and westbound service on alternate days.

Rail freight service in Montana has changed significantly over the past several years. Burlington Northern , which owns 91% of Montana's railroad miles, has streamlined its operations by selling or abandoning its less profitable branch lines.[4] Many of the state's rural agricultural areas have had rail services reduced or eliminated and must truck commodities to regional rail terminals.

There is little interaction between the railroad and aviation industries since the cost of transporting small quantities via rail is prohibitive when compared to truck or air freight. On the other hand, transportation of large volumes and heavy-weight freight is economical and practical only by rail. Passenger rail traffic competes with aviation to a small extent in only the northern portion of the state where the service is available. Travelers using Amtrak can reach destinations where connections with major airlines are available.

Figure II.9
Surface Transportation

The general trend in the operation of Montana's railroad system has been to de-emphasize passenger service while promoting the long haul of large or specialized loads.[5] The actual number of locations with rail service has significantly decreased over the past decade. The long-term future of passenger service in Montana is uncertain; however, freight hauling by rail is anticipated to remain at current levels for the foreseeable future.

2. Roadways

There are approximately 77,800 miles of highways and local roads in Montana.[6] The major roadway network, consisting of the federal-aid interstate and federal-aid primary systems, is shown in Figure II.9. The federal interstate system in Montana currently includes 1,192 miles of paved, four-lane highway. Interstate 15 traverses the state from Idaho to the south to Canada on the north via Dillon, Butte, Helena, Great Falls, and Shelby. Interstate 90 runs east-west between the Idaho state line and Billings, then turns southward toward Sheridan, Wyoming. Interstate 94 connects with Interstate 90 east of Billings and generally follows a northeasterly route to the North Dakota state line.

The state road system includes approximately 10,592 miles of roadway (5,501 miles primary, 4,730 miles secondary, and 361 miles urban) and serves all cities and rural towns in Montana.[7] Virtually all primary and urban highways are paved two- and four-lane roadways; however, the secondary road system is comprised of paved, graveled, and dirt-surfaced two-lane roads.

The 66,015 miles of local roads (city- and county-maintained) represent the majority of roadway miles in Montana.[8] Local roadways are most often gravel and dirt with only the most heavily traveled routes having paved surfaces. The roadways that make up the federal-aid highway system (interstate, primary, secondary, and urban) are financed through the Federal Highway Trust Fund with the State funding assistance. Federal revenues are generated by a fuel tax of 9 cents per gallon on gasoline or diesel fuel and a tax on tires. The State of Montana finances its highway projects through a 20 cents per gallon state fuel tax. Local roads are typically constructed and maintained by local governments with funds generated through property tax levies. The new federal highway bill recently passed by Congress, combined with highway gas tax increases approved by the State Legislature, will help maintain the quality of travel on Montana highways.

The state's system of highways and local roads enables private motorists, bus lines, and surface freight haulers to compete for traffic with the aviation industry. The different modes of commercial travel on the roadways of Montana are discussed below.

3. Surface Transportation Providers

a. Surface Freight Hauling

Several hundred freight transfer businesses that provide services ranging from mineral, timber, and livestock hauling to interstate transfer of raw materials currently operate in Montana. The majority of the long haul and interstate transfer business in Montana is provided by five or six large freight companies. These large firms operate on regular routes and provide service to virtually all of Montana. Several parcel businesses use the roadway system for pickup and delivery but rely upon aircraft for long-distance deliveries or overnight carrier service.

b. Statewide Bus Service

Eighteen bus lines operate scheduled service over designated routes in Montana; however, four firms control the majority of passenger-hauling business.[9] Scheduled service is provided to all major cities and towns in the state but is unavailable to most of Montana's smaller communities. Several charter bus companies also operate in the state and provide limited passenger service to Montana's communities. With the exception of special charters or group tours, there is little or no interaction between the aviation industry and the bus line transportation. Commercial bus lines provide substantial competition for commercial air carriers in many areas of rural Montana.

c. Municipal City Bus Service

Municipal bus service is available only in Montana's largest cities. Missoula's Mountain Line is the only municipal bus system that provides scheduled daily service to its airport. Helena's Dial-A-Ride serves Helena's airport, but due to the nature of the service, regular scheduling is not practical. Other cities with transit bus service do not have routes with connections to their municipal airports.

d. Taxi Cab and Limousine Service

There are 33 licensed cab or limousine companies that operate in 18 Montana cities.[10] All of these firms provide service to the local airports on an on-call basis. Limited standby cab service is available at most commercial airports in the state.

e. Shuttle Service

Several of Montana's airports have shuttle service between the airport and downtown or suburban locations. Local hotels and resorts may provide shuttle service to and from the airport for their guests in many of Montana's larger communities. Airport shuttle service is unavailable in communities with limited lodging facilities.

f. Rental Car Service

Montana has 10 airports that have on-site rental car facilities. Travelers may arrange for rental cars to be dropped in advance in some cities that do not have rental cars at the airport.

g. Airport Courtesy Car

The practice of providing a courtesy car for airport users has declined in Montana primarily due to high liability insurance costs that must be incurred by local municipalities. Currently, 18 airports in the state still provide courtesy cars for their out-of-town users.[11]

4. Airport Surface Access

A review of the surface access facilities and services available at Montana's airports was performed to identify surface transportation deficiencies. Based on this review, it was determined that the only air carrier airport with a surface access deficiency is Billings. This limitation is due to the local topography which restricts airport access road alternatives. Surface access to the other air carrier airports was found to be adequate, and no transportation capacity problems are expected from airport-generated traffic. All of the commercial and essential air service airports have continuous paved access and connecting roads to the local city centers.

Surface access to the General Aviation airports was also examined and was found to be generally adequate. In most cases, GA airport access roads have narrow, gravel surfaces and connect to a paved, two-lane county or state roadway. The most notable deficiency in GA airport access within the state is the condition of many of the roadway surfaces. Due to budgetary constraints and grant limitations, airport access roads are often neglected in favor of runway, taxiway, and apron improvements. There are no traffic capacity problems on access roads to Montana's GA airports.

The available ground transportation services and the distance from the airport to the city or town it serves are major considerations to GA pilots in Montana. The distance from the airport to the municipal area is often 5 to 10 miles and may represent significant delays in reaching the final destination of the pilots and passengers. In many cases traveling from the airport to town is the most difficult segment of a trip to arrange. Only 43 of the 114 airports examined have available ground transportation services to nearby communities.

Another very important aspect of the ground transportation system is the availability of a telephone at the airport. The airport telephone allows the pilot to make local ground transportation arrangements and thereby reduces the overall travel time to

the actual destination. The airport telephone also allows the pilot to check weather conditions and file flight plans with FAA Flight Service Stations. Only 68 of the 114 airports examined have a telephone located on-site for pilot use.

E. LAND USE AND ENVIRONMENTAL CONSIDERATIONS

1. Land Use

Montana is a rural state with much of its land used for agriculture (pre-dominantly cattle grazing and grain production) and timber production. Residential areas of low to moderate density are located only in the immediate vicinity of cities or towns. Scattered residential development is typical of rural Montana.

Most major municipalities have comprehensive land use plans and zoning restrictions within the corporate limits. Some municipalities also have land-use control over areas surrounding the town, typically up to a 5-mile radius depending on the size of its population. Montana counties practice general land-use planning, but only the most populated counties actually exercise positive control on the land use. There are very few cases of zoning in rural county areas of Montana. Typically, zoning has been established only when there is a need to regulate land use in a specific county area due to the presence of a special activity or land use development. The only development control imposed on most rural land use is public health regulations enforced by the State Water Quality Bureau and the Montana Department of Health and Environmental Sciences. The Montana Subdivision and Platting Act provides the framework for the residential development guidelines that are administered and enforced by local government.

The land use in the vicinity of Montana's airports was identified as part of the inventory process. The predominant land use in the vicinity of the state's air carrier airports is industrial and/or commercial with residential uses in the adjacent areas. The airports in Billings, Helena, and Great Falls are located close enough to the city proper that noise is a major consideration in future airport development.

Most of Montana's GA airports are located several miles from town with agricultural or forest land surrounding the site. The primary land-use compatibility problems at these airports are due to airspace obstructions rather than noise. Airspace encroachments by industrial development such as grain elevators, radio towers, and power lines are typical at many airports. Some GA airports have been developed too close to the municipal areas, (for example, Chinook, Hardin, and Kalispell City) and land-use conflicts due to airspace obstructions and noise have occurred.

2. Environmental Considerations

This section summarizes the environmental considerations used in the preparation of this plan. Areas of environmental concern that affect airport development in Montana include:

- Meteorologial factors
- Environmentally-sensitive areas
- Airport noise
- Air quality

a. Meteorological Factors

Montana's climate may be categorized as a continental variety with cold, dry winters and warm summers. High winds and storms are primary concerns for aviation activities during the year. Snowfall varies widely throughout the state but does not typically disrupt airport operations for long periods. Valley fog and ground fog are the most frequent meteorological problems experienced at Montana's airports. The predominant wind direction is from the west and is a major consideration in airport development and operations. Montana's weather seldom limits aviation activities.

b. Environmentally-Sensitive Areas

Much of Montana's unique rural character is due to its surrounding natural environment. The many natural features located within the state have more than local significance since visitors from throughout the nation travel to Montana to experience them. The state's unique character is sensitive to environmental changes, and efforts have been made by numerous federal and state agencies to ensure that the environment is preserved for future generations. Montana has two national parks, Yellowstone and Glacier, and ten national forests that are extensively used for outdoor recreation. Additionally, large portions of public lands have been dedicated as wilderness or natural areas. The Department of Fish, Wildlife, and Parks maintains ten state parks, 18 historic monuments, and more than 70 recreational areas for public use. Proposed airport developments are evaluated with respect to the potential effects on these sensitive areas.

c. Airport Noise

Airports are, by nature of the aircraft operating in and around them, noise generators. Noise at most Montana airports is not a major problem because sensitive receptors have not been located close to the aviation facilities and the density of development near the airport is low. Noise abatement procedures for aircraft operations are utilized to minimize the noise impacts of air carrier activities on nearby

urban areas. Noise analyses produced for existing master plans at the air carrier facilities will be utilized to assess noise impacts.

d. Air Quality

Air quality has not been a major consideration in the development of airports in Montana. Although federal and state air quality standards are periodically exceeded in several communities, pollutant levels are low and air quality is good throughout Montana. Western mountain valleys often experience extended periods of poor air quality during the winter due to thermal inversions which concentrate pollutants in an extremely stable layer of air. Airport operations in Montana are not significant contributors to local air quality problems.

F. SOCIO-ECONOMIC FACTORS

This section presents the latest statistics pertaining to the primary socio-economic characteristics - population, income, and employment - of the State of Montana. A knowledge of past trends in these areas is useful in predicting the level and direction of growth likely to occur in the study area. Such growth, in turn, impacts the need for aviation facilities and services.

Previous studies, accepted by the FAA, have shown a strong correlation between socio-economic growth or decline and the need for aviation facilities and services. For this reason, historic data and projected trends in socio-economic growth statistics are necessary inputs for forecasting of future aviation demand. The following sections will briefly discuss the three major socio-economic factors used in this forecasting.

The statistics examined in the following sections are based upon data collected by the U.S. Bureau of the Census and compiled by the U.S. Department of Commerce, Bureau of Economic Analysis; the Montana Department of Commerce, Office of Economic Analysis; and the University of Montana's Bureau of Business and Economic Research.

1. Population

Data describing the historic population of a region may be used to identify long-term growth trends and provide a basis for projecting future populations. The existing size of an area's population and its potential growth rate are important since these primary demographic factors may influence the existing level of airport traffic, its composition, and future aviation growth. The following text briefly examines Montana's historic populations and identifies growth trends that may be useful in the development of aviation forecasts.

a. Historic Population Data

Historical data and provisional population estimates for states in the Northwest Mountain Region of the United States (Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming) indicate that the region has been one of the fastest growing areas in the country between 1970 and the present. The regional population increased by nearly 36% during this period; however, Montana's population grew by only 19% over the same time period[12] indicating, as is presented in Figure 11.10, that Montana's population has grown at a slower rate than the population of the Northwest Mountain region.

Since 1970, Montana's population has slowly but steadily increased to its current level of approximately 819,000.[13] The historical census data for the state shows that the population increased by more than 13% during the 1970's and is estimated to have increased by only 4% between 1980 and 1986.[14] Poor economic and agricultural conditions have been responsible for the slight decline in population during the past two years.

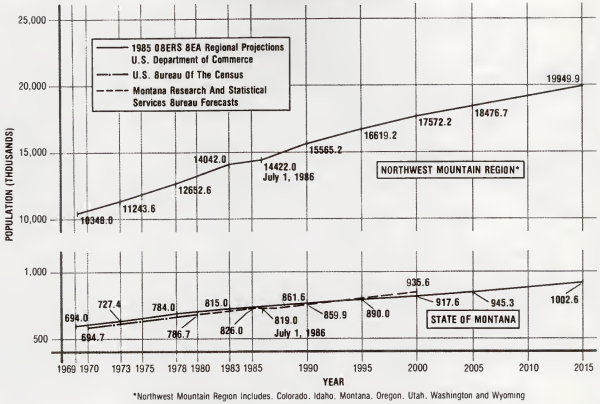
Since 1980, eight counties in Montana have experienced overall population growth exceeding 10%.[15] The fastest growing counties over the period have been Rosebud and Jefferson with growth rates of 24% and 15%, respectively. The populations of three counties are estimated to have declined by approximately 10% since 1980.[16] These counties include Deer Lodge, Silver Bow, and Wibaux. These major changes in county population may be primarily attributed to fluctuations in the resource industries. Historic population data and current population estimates for each Montana county are contained in Appendix D.

b. Population Projections

Population projections developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) suggest that the population of the Northwest Mountain Region will increase by some 38% between 1986 and 2015.[17] The agency expects Montana's population to increase by more than 22% during this same period. The State of Montana has projected populations only to the year 2000, but forecasts growth to occur at a slightly higher rate than the BEA projections. Figure II.10 depicts regional and state population projections through the year 2015.

The Montana Department of Administration, Research and Statistical Services Bureau, has developed population projections by county that suggest that populations in many of Montana's rural, agriculture-based counties will remain stable or slightly decrease. Continued growth is generally forecast for those counties that have experienced population increases since 1970. Population projections by county are presented in Appendix D.

Figure II.10
Historical And Projected Populations For Montana And The Region



*Northwest Mountain Region includes. Colorado. Idaho. Montana. Oregon. Utah. Washington and Wyoming

2. Employment

The level of employment in Montana is a measure of economic activity that may be indicative of the need for aviation facilities and services. The following narrative briefly examines Montana's employment trends since 1970 and offers projections of total employment more than 20 years into the future.

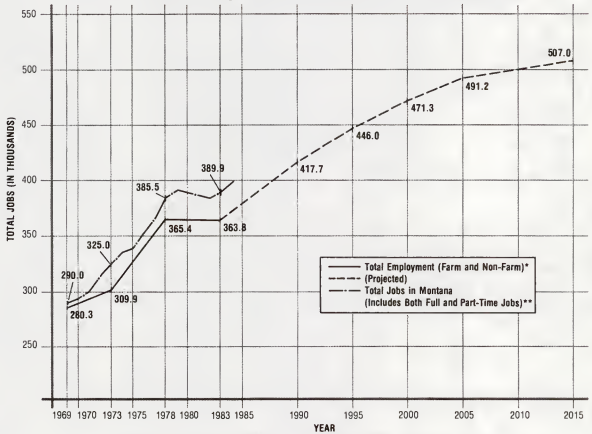
a. Historic Employment Data

Montana experienced steady and sustained economic growth between 1969 and 1979, even though the national economy suffered through recessions in 1970 and during 1974-75. Employment data compiled by the U.S. Department of Commerce, Bureau of Economic Analysis showed that employment in Montana (total number of jobs) increased by nearly 36% compared with only 25% for the nation during the period. Most of the employment increases in the state were realized in the services industry including health services, business and professional services, retail and wholesale trade, and transportation. Overall economic growth also occurred in the goods-producing industries (agriculture, mining, construction, and manufacturing) during the 1969-1979 period; however, agricultural employment declined notably because of increased mechanization of farm operations.

The period between 1979 and 1984 was a time of variable and erratic growth in the national and state economies. Although the U.S. economy generally grew, Montana's economy never fully recovered from the minor recessions that occurred during the period. Nationally, employment increased by 11%, while the state's employment increased by only 3%. Notable losses in the numbers of jobs occurred in Montana's mining and agricultural industries.

Figure II.11 presents historic employment trends for the state from 1969 through 1984. It should be noted that the employment data from the U.S. Bureau of Economic Analysis and the Montana Office of Economic Analysis differs slightly because the State counts the number of jobs in each county, whereas the national data counts only the number of persons working regardless of whether a worker has more than one job. This graph indicates that employment is steadily increasing in Montana.

Figure II.11
Historic And Projected Employment In Montana



**U.S. Bureau of Economic Analysis, compiled by office of Economic Analysis, Montana Department of Commerce 1986
*U.S. Department of Commerce, Bureau of Economic Analysis, 1985 OBERS Regional Projections

Areas of Montana that gained jobs faster than the average annual growth rate of 2.4% for the 1969-84 period included counties in the Billings, Bozeman, Helena,

Kalispell, Miles City, and Missoula areas.[18] All other areas of Montana, with the exception of the Anaconda-Butte area, gained jobs slower than the state average annual growth rate. Historic employment by county is presented in Appendix D.

b. Future Employment Trends

The U.S. Bureau of Economic Analysis projects that total employment in Montana will continue to increase well into the next century. This increase is partially based on the continued increase in the number of jobs in the service industry. Figure II.11 shows the BEA's forecast trend for employment in Montana. Similar to the population forecasts for the region, the agency's projection for employment growth in Montana to the year 2015 is substantially slower than for surrounding states.

Maxine C. Johnson of the Bureau of Business and Economic Research at the University of Montana annually reviews statewide economic data and develops a short-term forecast of future economic conditions. Major trends identified in her most recent forecast for the next three years in Montana are briefly discussed below:[19]

- Overall Economy: Over the next three years, Montana's economy is expected to undergo very modest growth.
- Mining Industry: Some 600 to 700 new jobs should be created in metal mining as new operations begin at the Butte mines, the Montana Tunnels mine near Helena, and at the platinum-palladium mine in Stillwater County. The coal industry is expected to remain stable or to slightly decline. The oil and gas industry is likely to experience a slow improvement.
- Manufacturing: Barring plant closures, modest increases are foreseen in manufacturing operations other than wood products.
- Forest Products: The outlook in this industrial sector is for reduced employment due to increased efficiency for raw materials processing.
- Railroads: Forecasts suggest that railroad operations will decline slightly.
- Travel and Recreation: Industry should remain stable unless the State of Montana can capture a larger share of the recreational tourism market.
- Government: Employment in government is expected to be stable during 1987 and decline slightly during 1988 and 1989. Expansion at Malmstrom Air Force Base and the proposed Midgetman project may provide additional full-time and construction jobs.

3. Personal Income

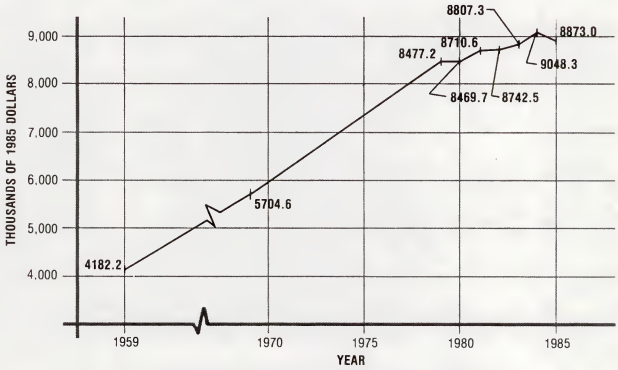
Data describing growth in personal income levels has proven to be valuable for explaining levels and patterns of aviation activity. The purchasing power available to residents of an area over time can be related to the consumer's ability to use aviation facilities and services for travel or pleasure. High personal income levels in an area may be indicative of higher than average levels of consumer spending on air

travel. The following narrative examine historical trends in personal income and per-capita income levels.

a. Total Personal Income

As previously mentioned, the period from 1969-79 saw Montana's economy experience sustained growth. Total personal income after inflation grew by some 57% compared to 44% for the U.S. during the same period. Increases in personal income came primarily in the service-producing industries. Earnings in agriculture and metal mining declined during the 1970's. Between 1979 and 1985, inflation-adjusted personal income in Montana decreased by 0.5% while it increased nationally by nearly 15%. Figure II.12 presents inflation adjusted figures for total personal income for the State of Montana since 1959. It is evident from this graph that the rate of increase in total personal income for the 1979-1985 period declined significantly from that experienced during the previous 20-year period.

Figure II.12
State of Montana
Total Personal Income (In 1985 Dollars)



Source: Office of Economic Analysis, Montana Department of Commerce, Economic Conditions in Montana, 1986, December, 1986

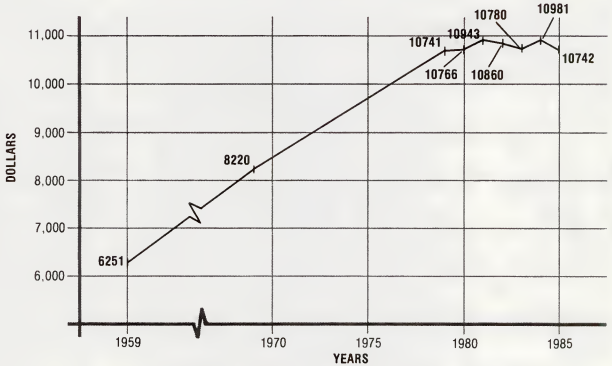
Between 1969 and 1979, high-growth areas for total personal income were noted for counties in the Missoula, Bozeman, Helena, Billings, and Kalispell areas. Low-

growth areas for total personal income during the 1970's were counties in the Glasgow-Wolf Point, Havre, Great Falls, Lewistown, Anaconda-Butte, and Miles City areas. During the most recent period (1979-1985), growth in total personal income was highest in the Bozeman, Helena, and Billings areas. The remainder of the state experienced little growth or declines in inflation-adjusted, total personal income through 1985.

b. Per Capita Income

The historic trends in the level of per-capita personal income in the State of Montana are similar to that previously discussed for total personal income. Figure II.13 depicts the overall increase in per capita personal income in Montana since 1959. It is apparent from the graph that per capita income levels grew substantially through the 1970's but leveled off during the first five years of the 1980's.

Figure II.13
State of Montana
Per Capita Personal Income (In 1985 Dollars)

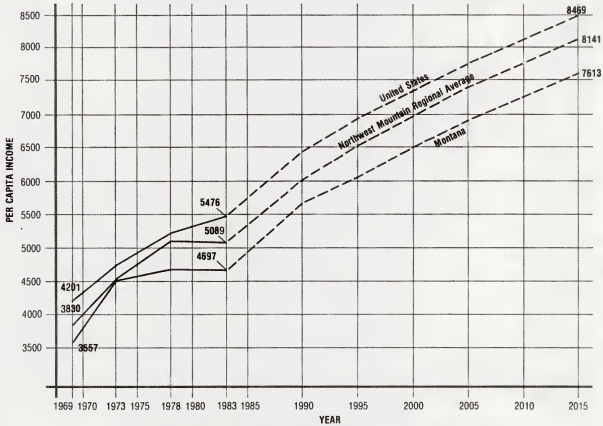


Source: Office of Economic Analysis, Montana Department of Commerce, Economic Conditions in Montana, 1986, December, 1986

Montana's Department of Commerce statistics for county-wide income levels during 1979, a relatively good year in the state economy, showed that the Glasgow-

Wolf Point and Havre areas had the lowest per capita incomes and Billings and Helena-area counties had the highest per capita incomes. The remainder of the state had income levels that were near the statewide average. In 1985, per-capita income levels varied more throughout the state, but the Helena and Billings areas still had the highest incomes. The lowest per capita incomes were reported in counties in the Miles City and Glendive-Sidney areas. Historic per capita personal income statistics for Montana counties are presented in Appendix D.

Figure II.14
Projected Per Capita Income For U.S., Region, *And Montana (1972 Dollars)



*Northwest Mountain Region Includes Colorado, Idaho, Montana, Oregon, Utah, Washington and Wyoming
Source: U.S. Department of Commerce, Bureau of Economic Analysis,
1985 OBERS BEA Regional Projections

c. Income Projections

An examination of income projections is necessary because of their potential importance in forecasting aviation demand. No long-term projections of income levels are available from the State of Montana Department of Commerce; thus, it was necessary to rely on economic data contained in the U.S. Department of Commerce's 1985 OBERS BEA regional projections of economic activity. Exhibit II.14 presents the BEA projections for national, regional, and state per-capita incomes through the year 2015. It is evident from the graph that per-capita income

levels are projected to increase at approximately the same rate for the U.S., the region, and state over the next 30 years. However, Montana's future per capita income is projected to remain significantly lower than regional or national income levels.

G. APPLICABLE LAWS, ORDINANCES, AND REGULATIONS

This section presents a brief summary of relevant federal and state legislation and regulations which may affect the development of the Montana State Aviation System.

1. Federal Legislation

The federal government has assisted the aviation industry from its inception. The Civil Aeronautics Board, established in 1938, has been responsible for the economic regulation of commercial air transport; however, its responsibilities were terminated with the abolition of the Board on January 1, 1985.

Those aspects of aviation related to safety have been and will continue to be subject to the regulatory and control functions of the Federal Aviation Administration (FAA). The FAA establishes, operates, and maintains air traffic control and navigation facilities and provides both technical standards and funding for airport facility construction.

The discussion of federal legislation in this document focuses on the statutes and regulations that provided the basis for present legislation or have been important to the aviation industry as it exists today. The major federal legislation governing aviation is discussed in the following narrative:

a. Federal Airport Act of 1946

Prior to 1946, airports in the U.S. were financed and operated by state, county, or municipal governments. Because of the large capital investment required of state or local governments, airport development during this period was slow. The Federal Airport Act of 1946 was enacted to help fund the development of a national system of airports through the appropriation of $520 million over a seven-year period. Under the provisions of this program, federal funding for 50% of eligible projects had to be matched by local funding. This program worked well in larger cities but did not benefit smaller cities since funding even 50% of the cost of airport development was too much of an economic burden. Nevertheless, this program continued until 1970 when it was replaced with the Airport and Airway Development Act of 1970.

b. Federal Aviation Act of 1958

Congress passed the Civil Aeronautics Act in 1938 which provided the basis for development and expansion of the aviation industry until 1958. Then Congress passed the Federal Aviation Act, which incorporated major portions of the previous Civil Aeronautics Act and contained provisions for creating the Federal Aviation Agency, later entitled the Federal Aviation Administration. In addition, the Act continued the Civil Aeronautics Board (CAB) as an agency and empowered it with the economic regulation of air carriers. The Federal Aviation Agency was charged with the regulation and promotion of civil aviation to best foster its development and to provide for safe and efficient use of airspace by civil and military aircraft.

c. Department of Transportation Act of 1966

This Act was passed by Congress in order to consolidate the many federal agencies regulating the national transportation systems (with the exception of the CAB). Under this Act, the Department of Transportation was authorized with the development and administration of national transportation policies and programs. The Act requires that the Department encourage the cooperation of federal, state, and local governments, carriers, labor, and other interested parties toward the achievement of national transportation objectives. The Department of Transportation is headed by the Secretary of Transportation.

d. Airport and Airway Development Act of 1970, as Amended

The Airport and Airway Development Act (AADA) of 1970 replaced the Federal Airport Act of 1946. This Act provided federal funds to develop a system of public airports in the United States. The Act empowered the Secretary of Transportation to develop, approve, and authorize federal grants for airport planning and development. Federal grants were administered by the Federal Aviation Administration under the Airport Development Aid Program. Unlike the 1946 Act, the AADA of 1970 provided federal funding for 75% of eligible project costs. Amendments to the Act in 1976 revised the federal share of eligible project costs to 90% for fiscal years 1976 through 1978 and to 80% for fiscal years 1979 and 1980. Subsequent amendments retained the 90% federal funding level for 1979 and 1980.

e. Airline Deregulation Act of 1978

During the mid-1970's, a movement toward deregulation of the transportation industries resulted in significant changes in the airline industry. The basis of the Airline Deregulation Act of 1978 was a report by the U.S. General Accounting Office stating that air rates might have been 22% to 25% cheaper between 1969 and 1974 had price competition been allowed. The purpose of the law was to develop an air transportation system dependent upon competitive market forces to determine the

quality, variety, and price of air services. This Act, among other things, provided for gradual and unrestricted competition among air carriers and for the dissolution of the CAB. Since economic control of the industry has been lifted, air carriers are subject to antitrust laws. The 1978 Airline Deregulation Act is actually an amendment to the Federal Aviation Act of 1958.

f. Airport and Airway Improvement Act of 1982

The Airport and Airway Improvement Act of 1982 replaced the Airport and Airway Development Act of 1970. This Act continued the policy of developing public airport systems as stated in the 1970 Act but with some changes. The Act established different funding categories for airports and mandated minimum expenditures in each category. For the first time, it also made certain privately-owned airports eligible for federal funding for airport improvements. A private airport is eligible only if it has been designated as a reliever airport by the FAA or if it is a commercial service airport (scheduled air carrier service) enplaning at least 2,500 passengers annually. The Act requires that at least 10% of the available discretionary funds be spent to improve reliever airports. The federal share of eligible projects is set at 75% for primary (large) commercial service airports and at 90% for the remaining airports.

g. Other Federal Legislation

The following Acts of Congress, although not specifically directed toward aviation, nevertheless affect the industry and its operations. The following text briefly summarizes the relationship between this legislation and aviation:

National Environmental Policy Act of 1969 (NEPA): This Act establishes a national policy for protection of the environment and requires all federal agencies to include a detailed statement on the environmental impacts of a proposed major action. Development activities under the Airport and Airway Development Act, as amended, have been judged to be major significant federal actions requiring environmental assessments or detailed environmental impact studies.

Clean Air Act of 1970, as Amended: This Act provides guidelines for determining air quality control techniques and for establishing ambient air quality standards. Airports in Montana are affected by this law since the facilities attract, or may attract, mobile-source activity that may violate air-quality standards.

Federal Water Pollution Control Act of 1972: The Act declared, as a national goal, that discharge of pollutants into navigable water be eliminated by 1985.The Environmental Protection Agency (EPA) has new effluent limitation guidelines and source performance standards for the aviation industry under study.

Noise Control Act of 1972: This legislation established the promotion of an environment free from harmful noise as a national policy. The EPA was required to submit regulations to the FAA for providing noise control and abatement at all airports.

Rehabilitation Act of 1973: Regulations contained in the Act require airport operators to modify existing facilities and ensure that new facilities are constructed to serve the handicapped. The legislation established the general accessibility standards for new terminal buildings at airports enplaning 10,000 or more passengers each year. Airports meeting this criteria in Montana include Logan International (Billings) , Gallatin Field (Bozeman), Bert Mooney (Butte), Great Falls International, Helena Regional, Glacier Park International (Kalispell). and Johnson-Bell Field (Missoula).

Endangered Species Act of 1973: The Act directs all federal agencies to protect endangered and threatened species. The legislation primarily affects the expansion of and siting of airport facilities.

Transportation Safety Act of 1974: This legislation established the National Transportation Safety Board for the purposes of protecting the country against the risks associated with the transportation of hazardous materials by all modes including aviation.

Resource Conservation and Recovery Act of 1976/Hazardous and Solid Waste Amendments of 1984: The law prohibits the installation of underground tanks without protection against corrosion and creates a tank notification/registration program for all underground tanks.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970: This law provides for the relocation of any business (including farm operations) or residence when required by a federally-funded project. The Act requires that the owner be offered assistance in finding a new location and re-establishing the business.

National Historic Preservation Act of 1966: This Act requires that an initial review shall be made to determine if any properties involved in a federally-funded project are eligible for inclusion in the National Register of Historic Places.

Archaeological and Historic Preservation Act of 1974: This law provides for the survey, recovery, and preservation of significant scientific, pre-historical, historical, archaeological, or paleontological data which may be destroyed or irreparably lost due to a federally-funded project.

2. State Legislation

Title 67 of the Montana Codes Annotated (MCA) identifies and describes the policies, regulations, and laws which specifically apply to aviation in the state. Additionally, Title 67 outlines the duties and powers of the state government agencies responsible for administering aviation activities in Montana. This section of law has eight chapters which describe aviation laws and three chapters which are reserved for future laws. The following sections briefly describe the primary subject matter included in Title 67, MCA:

a. General Provisions

Chapter 1 of Title 67 is used to define airport and aviation terms and to outline the overall intentions of state government for aeronautics in Montana. This chapter also includes the "Uniform State Law for Aeronautics" which discusses the uniform airspace provisions of Montana and the lawfulness of flights and landings. An

additional section in Chapter 1 identifies the financial policies and sources which may be implemented by the state regarding aviation. Specifications regarding loans, the state gasoline tax, and the state share of improvement projects are identified in the chapter.

b. Administration and Regulation

Chapter 2 establishes the Department of Commerce's role in administering, regulating, and promoting aviation in Montana. This section of law also establishes the Department's authority to obtain the property, facilities, easements, goods, and services necessary to facilitate the operations of state airports. Chapter 2 further discusses the intergovernmental cooperation between the Department of Commerce and federal/state government and allows the State to receive federal funds or private moneys for airport development on behalf of municipalities.

Chapter 3 contains the general principles and provisions regarding the regulation and licensing of aircraft and pilots in Montana. This section also sets fines for violations and establishes regulations for commercial air operators, requiring the provision of adequate liability insurance. Additionally, this chapter states the powers of the Board of Aeronautics including the regulation of all air-carrier operations.

c. Noise, Height, and Land Use Regulation

Chapter 4 of Title 67 defines compatible noise, height, and land-use restrictions for airports. The law requires that each local government having an airport with an established primary instrument approach runway must designate an airport influence zone based on FAA guidelines. Within these areas, height restrictions consistent with Federal Aviation Regulation (FAR) Part 77 must be followed. Other provisions of this chapter identify procedures for local governments to amend or adopt land-use rules relating to aviation and establish a Board of Adjustment to hear appeals or grant adjustments to airport hazards.

Chapter 5 requires that the height of buildings and other structures be regulated within a distance of two miles from any public airport or landing field. The statute further establishes requirements for airport approach zones and horizontal surfaces. An important part of this section is that local government is given the right to acquire a building, structure, property, or natural barrier that exceeds airport height restrictions to eliminate the approach obstruction.

The Airport Zoning Act, contained in Chapter 6, empowers every political subdivision having an airport hazard area with the right to adopt, administer, and enforce airport zoning for the hazard area. Prior to the initial zoning of such an area, the political subdivision must appoint an Airport Zoning Commission to establish zones and the regulations pertaining to them. A Board of Adjustment is also created

as a permitting body and is required to hear appeals or grant variances from the zoning rules for the airport hazard area. This specific chapter in MCA is weakly written since any effort to zone under Chapter 6 may be voted down by only 40% of the affected landowners.

d. Other Aviation-Related Statutes

Chapter 23 of Title 15, MCA makes provisions for the annual taxation of airline property, activity, and revenues. The law requires each airline company engaged in commerce in Montana file an annual report to the Department of Revenue (DOR) which identifies the company's general background, its financial activity, and its aviation activity totals for the year. The DOR is also authorized by this statute to determine the valuation of all property owned or used by the airlines operating in the state. The State's share of the property valuation is determined by the DOR.

Chapter 6 of Title 15, MCA, exempts from property taxation, aircraft which are 40 or more years old and not regularly used for transportation.

3. Local Legislation

The local units of government in Montana are restricted in their powers and activities to those permitted by state law. Among such powers are taxation, issuance of bonds, rights of eminent domain, and so on, as necessary for the proper conduct of local government. The provisions of Montana law that directly affect local government's sponsorship of airports are discussed below:

a. Municipal Airports

Chapter 10 of Title 67, MCA, authorizes every municipality to establish, improve, or regulate airports. The statutes in this chapter of Montana law empower municipalities to create an airport advisory board; to acquire land for or dispose of property/equipment for airport purposes; to establish rates and privileges for airport users, and to establish taxation of up to 2 mills for the purpose of operating the airport.

b. Airport Authorities

The formation and powers of municipal and regional airport authorities is discussed in Chapter 11 of Title 67. The statutes call for the appointment of a board of five commissioners to oversee the operations of the airport authorities. The airport authorities have the power to levy taxes, borrow money or issue bonds for airport purposes; to develop, improve, maintain, regulate, and protect airport facilities; to construct, equip, and acquire buildings or other facilities and services; and to establish comprehensive airport zoning regulations.

ENDNOTE REFERENCES - CHAPTER II

1. Federal Aviation Administration, Order 7480.1A - Guidelines for Airport Spacing and Traffic Pattern Airspace Areas, August, 1971.

2. John McDermit, Tower Supervisor, Billings ATC, Telephone Communication, August 4, 1988.

3. Clark Desing, Airspace Procedures Specialist, Salt Lake City Center, Telephone Communication, August 4, 1988.

4. John Craig, Montana Department of Commerce, Personal Communication, April 7, 1987.

5. Craig, Personal Communication, April 7, 1987.

6. 1985 Montana Highway Federal-Aid Road Log.

7. 1985 Montana Highway Federal-Aid Road Log.

8. William Cloud, Montana Department of Highways Planning and Research Bureau, Personal Communications, April 6, 1987.

9. Bonnie Allen, Montana Public Service Commission, Personal Communication, April 7, 1987.

10. Allen, Personal Communication, April 7, 1987.

11. Montana Aeronautics Division, Montana Airport Directory, 1987.

12. U.S. Department of Commerce, Bureau of Economic Analysis, 1985, OBERS BEA Regional Projections, Vol. 1.

13. Montana Department of Commerce, Census and Economic Information Center, July 7, 1987.

14. Montana Department of Commerce, July 7, 1987.

15. Montana Department of Commerce, July 7, 1987.

16. Montana Department of Commerce, July 7, 1987.

17. U.S. Department of Commerce, Bureau of Economic Analysis, 1985 OBERS BEA Regional Projections, Vol. 1.

18. Montana Department of Commerce, Office of Economic Analysis, Economic Conditions in Montana, 1986, December, 1986.

19. Maxine C. Johnson, "The State Outlook for 1987", Montana Business Quarterly, Volume 25, Number 1, Spring,1987.

Chapter III

Forecasts of Aviation Demand

CHAPTER III: FORECASTS OF AVIATION DEMAND

Forecasts of aviation demand are the basis for determining the facilities that will be required in the future. The validity of the System Plan will only be as reliable as the accuracy of these forecasts. Therefore, every effort has been made to use current and reasonable forecasting techniques and information.

Forecasts have been made for both commercial and general aviation activities. These forecasts include the following:

Scheduled Air-Service Airport Activity

- Enplanements
- Operations
- Air cargo

General Aviation Airport Activity

- Based aircraft
- Fleet mix
- Operations

A. METHODOLOGIES AND FORECASTS FOR AIR-CARRIER AIRPORTS

1. Enplanements

Forecasts for enplanements for commercial airports are contained in the FAA publication, "Terminal Area Forecasts, FY 1987-2000." This reference shows historical and projected enplanements by airport and is the most current reference available. The last year of record for this report is 1985. As a consequence, there are some inconsistencies in the forecasts due to the changes that have occurred in enplanements at several airports. In those cases where the forecasts appeared inconsistent with current conditions, the Airport Manager was consulted and a more realistic forecast developed. The forecasts of commercial passenger enplanements for the scheduled air service airports are shown in Table III.1

Since no projection is given beyond the year 2000 in the FAA's "Terminal Area Forecasts" and the State Aviation System Plan extends to the year 2005, the

forecasts have been extrapolated for the additional five-year period. The assumption for the extrapolation is that the growth for the 2000-to-2005 year period will be identical to the historical growth as shown in the TAF.

Enplanements include all commercial carriers including scheduled route carriers and air-taxi operations.

TABLE III.1

FORECASTS OF COMMERCIAL PASSENGER ENPLANEMENTS FOR SCHEDULED AIR-SERVICE AIRPORTS

Airport/City	1986[1]	1990	1995	2000	2005[2]
Bert Mooney/Butte[3]	28,288	31,000	41,000	51,000	61,000
Billings-Logan Int'l./Billings	340,983	385,000	438,000	502,000	566,000
Dawson Community/Glendive[4]	1,532	2,000	2,500	3,000	3,500
Frank Wiley Field/Miles City	1,667	2,000	2,500	3,000	3,500
Gallatin Field/Bozeman[5]	105,122	130,000	142,000	155,000	179,000
Glacier Park Int'l./Kalispell	66,326	80,000	97,000	115,000	132,000
Glasgow Int'l./Glasgow	2,555	4,000	5,000	7,000	8,000
Great Falls Int'l./Great Falls[6]	152,116	165,000	182,000	199,000	215,000
Havre City-County/Havre	1,000[7]	1,500	2,000	2,500	3,000
Helena Regional/Helena	51,116	74,000	90,000	106,000	122,000
Johnson-Bell Field/Missoula[8]	139,573	160,000	178,000	214,000	250,000
Lewistown Municipal/Lewistown[9]	540[7]	800	1,000	1,200	1,500
Sidney-Richland Municipal/Sidney	7,662	7,000	9,000	10,000	11,000
Wolf Point Int'l./Wolf Point	1,808	3,000	4,000	5,000	6,000
Yellowstone/West Yellowstone	2,796	3,000	4,000	5,000	6,000

Source: "Terminal Area Forecasts, FY 1987-2000," U.S. Dept. of Transportation, Federal Aviation Administration, April, 1987.

1 1986 Enplanements from "DOT/TSC ACIS Database, U.S. Airport Enplanement Activity, 1981-1986 Calendar Years."

2 2005 Enplanements extrapolated from trends contained in "Terminal Area Forecasts."

3 Forecast estimated based on discussions with Airport Manager, Angelo Petroni, March 8, 1988.

4 Forecast estimated based on discussions with Airport Manager, Leon Baker, July 12, 1988.

5 Forecast estimated based on discussions with Airport Manager, Ted Mathis, March 4, 1988.

6 The growth rate used in the Great Falls Master Plan was applied to the 1986 enplanements to develop forecast values.

7 Estimated.

8 Forecast estimated based on discussions with Airport Manager, Russ Pankey, March 10, 1988.

9 Forecast estimated based on discussions with Airport Manager, Fred Knerr, March 10, 1988.

2. Operations at Scheduled Air-Service Airports

Forecasts of operations at scheduled air-service airports are also contained in the FAA's "Terminal Area Forecasts" report. The TAF contains historical operations from 1981 through 1985 and projected operations from 1987 through the year 2000 for each of Montana's scheduled air-service airports.

A review of the FAA forecasts revealed some inconsistencies in the data listed for several airports. The historic data used in the TAF comes from FAA 5010 Inspection Forms. In some cases the operations estimate reported on the 5010 Forms do not accurately reflect current activity levels. As a result, some of the forecasts included in the TAF are similarly flawed. It should be noted that although some of the baseline data in the TAF is questionable, the growth rates used in the forecasts are realistic.

1985 was the last year of record and was used as the baseline for forecasting operations in the TAF. At several airports the current activity levels are significantly less than 1985 estimates reported on the 5010 Forms. Therefore, some forecasts appear unrealistically high.

When baseline data inconsistencies were identified, the individual Airport Master Plan was referenced and the Airport Manager contacted. In these cases, a more accurate base-year estimate was developed. The same rate of growth used in the TAF was applied to the new baseline to generate the operations forecast.

A relative analysis of the forecasts based on the TAF growth rates revealed inconsistencies at two locations, Missoula and Helena. In both cases, the forecasts were unexplainably higher than other Montana airports of comparable size. In those cases different growth rates were developed. The growth rates contained in the Airport Master Plan for Missoula appeared more realistic and were, therefore, used. The rate of growth for Helena was developed by averaging the rates used for the Great Falls and Missoula Airports.

Since the TAF only provided forecasts to the year 2000, the forecasts were extrapolated to 2005 by examining the growth trends and projecting the trend for an additional five years.

The forecasts for operations at the 15 scheduled air-service airports are shown in Table III.2.

TABLE III.2

FORECASTS OF ANNUAL OPERATIONS
SCHEDULED AIR-SERVICE AIRPORTS

Bert Mooney/Butte (TAF forecast has been adjusted based on 1987 data provided by Airport Manager, Angelo Petroni, 3/8/88 and with Butte FSS Chief, Howard Jensen, 3/16/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987	1,460	11,000	7,700	1,200	21,360	5,500		5,500	26,860
1990	1,600	12,700	7,900	1,200	23,400	6,000		6,000	29,400
1995	1,700	15,500	8,300	1,200	26,700	6,500		6,500	33,200
2000	1,900	18,300	8,700	1,200	30,100	7,000		7,000	37,100
2005	2,100	21,100	9,000	1,200	33,400	8,000		8,000	41,400

Billings-Logan Int'l./Billings (TAF forecast has been adjusted based on 1987 data provided by Assistant Airport Manager, Tom Binford.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987	14,686	21,605	45,305	530	82,126	33,045		33,045	115,171
1990	15,900	22,100	55,000	1,000	94,000	35,000		35,000	129,000
1995	17,900	22,900	72,000	1,000	113,800	39,000		39,000	152,800
2000	19,900	23,800	88,000	1,000	132,700	42,000		42,000	174,700
2005	21,900	24,600	105,000	1,000	152,500	46,000		46,000	198,500

Dawson Community/Glendive (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Leon Baker, 3/8/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		1,518	3,650	15	5,183	1,460		1,460	6,643
1990		2,000	3,800		5,800	1,600		1,600	7,400
1995		2,500	4,000		6,500	1,800		1,800	8,300
2000		3,000	4,200		7,200	2,000		2,000	9,200
2005		3,000	4,400		7,400	2,200		2,200	9,600

TABLE III.2 (CONT.)

FORECASTS OF ANNUAL OPERATIONS
SCHEDULED AIR-SERVICE AIRPORTS

Frank Wiley Field/Miles City (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Sig Urgin, 3/9/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		3,000	13,000		16,000	7,000		7,000	23,000
1990		4,000	13,600		17,600	7,300		7,300	24,900
1995		5,000	14,600		19,600	7,900		7,900	27,500
2000		6,000	15,600		21,600	8,400		8,400	30,000
2005		7,000	16,600		23,600	8,900		8,900	32,500

Gallatin Field/Bozeman (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Ted Mathis, 3/9/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987	8,760	11,000	6,700	400	26,860	23,900		23,900	50,760
1990	9,300	12,800	7,000	400	29,500	26,000		26,000	55,500
1995	10,100	15,800	7,000	400	33,300	27,000		27,000	60,300
2000	11,000	18,900	8,000	400	38,300	28,000		28,000	66,300
2005	11,800	21,900	8,000	400	42,100	29,000		29,000	71,100

Glacier Park Int'l./Kalispell (TAF forecasts have been adjusted based on 1987 data contained in Glacier Park Int'l. Master Plan and discussions with Airport Manager, Monte Eliason.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987	4,380	9,000	16,600	50	30,030	11,000		11,000	41,030
1990	4,800	11,800	17,100	50	33,750	11,300		11,300	45,050
1995	5,500	16,400	18,000	50	39,950	11,900		11,900	51,850
2000	6,100	21,000	18,900	50	46,050	12,400		12,400	58,450
2005	6,800	25,600	19,800	50	52,250	13,000		13,000	65,250

TABLE III.2 (CONT.)

FORECASTS OF ANNUAL OPERATIONS
SCHEDULED AIR-SERVICE AIRPORTS

Glasgow Int'l./Glasgow (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Vic Wokal, 3/9/88).

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		4,000	15,000	100	19,100	7,000		7,000	26,100
1990		4,900	15,400	100	20,400	7,300		7,300	27,700
1995		6,500	16,200	100	22,800	7,700		7,700	30,500
2000		8,000	16,900	100	25,000	8,200		8,200	33,200
2005		9,500	17,600	100	27,200	8,600		8,600	35,800

Great Falls Int'l./Great Falls (TAF forecasts have been adjusted based on 1985 data contained in the Great Falls Master Plan.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1985	10,407	6,062	23,400	5,000	44,869	15,000	4,000	19,000	63,869
1990	11,000	6,900	26,700	6,000	50,600	15,400	4,000	19,400	70,000
1995	12,000	7,700	30,000	6,000	55,700	15,800	4,000	19,800	75,500
2000	12,000	8,500	33,300	6,000	59,800	16,200	4,000	20,200	80,000
2005	13,000	9,300	36,600	6,000	64,900	16,500	4,000	20,500	85,400

Havre City-County/Havre (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Charles Zortman, 3/11/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		4,000	12,000	48	16,048	5,000		5,000	21,048
1990		4,900	12,600	50	17,550	5,200		5,200	22,750
1995		6,400	13,500	50	19,950	5,600		5,600	25,550
2000		8,000	14,400	50	22,450	6,000		6,000	28,450
2005		9,500	15,300	50	24,850	6,400		6,400	31,250

TABLE III.2 (CONT.)

FORECASTS OF ANNUAL OPERATIONS
SCHEDULED AIR-SERVICE AIRPORTS

Helena Regional/Helena (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Ron Mercer, 3/16/88. Growth rates developed from average of Great Falls and Missoula Airport rates.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987	2,900	16,000	21,000	6,133	46,033	12,000	2,446	14,446	60,479
1990	3,100	17,100	22,500	6,100	48,800	12,500	3,000	15,500	64,300
1995	3,300	19,000	25,100	6,100	53,500	13,200	3,000	16,200	69,700
2000	3,600	20,900	27,600	6,100	58,200	14,000	3,000	17,000	75,200
2005	3,800	22,800	30,200	6,100	62,900	14,700	3,000	17,700	80,600

Johnson-Bell Field/Missoula (TAF forecasts have been adjusted based on 1986 data provided by Airport Manager, Russ Pankey, 3/10/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1986	5,492	7,800	30,688	346	44,326	22,222		22,222	66,548
1990	6,000	8,400	33,000	350	47,750	24,000		24,000	71,750
1995	6,660	9,200	36,300	350	52,450	26,300		26,300	78,750
2000	7,200	10,000	39,400	350	56,950	28,500		28,500	85,450
2005	7,800	10,800	42,500	350	61,450	30,800		30,800	92,250

Lewistown Municipal/Lewistown (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Fred Knerr, 3/11/88.)

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		3,500	11,000	700	15,200	5,000		5,000	20,200
1990		4,000	11,500	1,000	16,500	5,200		5,200	21,700
1995		5,000	12,300	1,000	18,300	5,500		5,500	23,800
2000		6,000	13,100	1,000	20,100	5,800		5,800	25,900
2005		7,000	13,900	1,000	21,900	6,200		6,200	28,100

TABLE III.2 (CONT.)

FORECASTS OF ANNUAL OPERATIONS
SCHEDULED AIR-SERVICE AIRPORTS

Sidney-Richland Municipal/Sidney (TAF forecasts have been adjusted based on 1987 data provided by Airport Manager, Don Rees, 3/17/88).

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1987		9,000	11,000		18,000	7,000		7,000	25,000
1990		11,000	11,300		22,400	7,400		7,400	29,800
1995		14,600	11,800		26,400	8,100		8,100	34,500
2000		18,000	12,400		30,400	8,700		8,700	39,100
2005		21,500	12,900		34,400	9,400		9,400	43,800

Wolf Point Int'l./Wolf Point

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1985		3,160	8,500		11,660	1,750		1,750	13,410
1990		4,000	9,000		13,000	2,000		2,000	15,000
1995		4,500	9,500		14,000	2,000		2,000	16,000
2000		5,000	10,000		15,000	2,000		2,000	17,000
2005		5,000	11,000		16,000	2,000		2,000	18,000

Yellowstone/West Yellowstone

	Itinerant					Local			
	Air Carrier	Air-Taxi Commuter	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1985	566	300	4,000	20	4,886	500		500	5,386
1990	1,000		4,000		5,000	1,000		1,000	6,000
1995	1,000		4,000		6,000	1,000		1,000	6,000
2000	1,000		5,000		6,000	1,000		1,000	7,000
2005	1,000		5,000		6,000	1,000		1,000	7,000

Sources: (1) 1985 Estimates from FAA Form 5010
(2) 1990, 1995, and 2000 forecasts from FAA "Terminal Area Forecasts, FY 1987-2000".
(3) 2005 Forecast extrapolated from "Terminal Area Forecasts."

3. Air Cargo

Forecasts for air cargo are available only in Airport Master Plans. Historical data is published in the FAA publication, "Airport Activity Statistics of Certified Route Air Carriers," which only provides information on the eight certified route air-carrier airports in Montana. For the remaining airports, the estimate of 20 pounds of air cargo per each air-taxi/commuter departure suggested by Northwest Airlink was used.

Forecasts for air cargo are shown in Table III.3.

TABLE III.3

FORECASTS OF AIR CARGO FOR SCHEDULED AIR-SERVICE AIRPORTS

Airport/City	Forecast				
	1985	1990	1995	2000	2005
Bert Mooney/Butte[3]	915	1125	1334	1544	1753
Billings-Logan Int'l./Billings[4]	2717	2929	3141	3354	3566
Dawson Community/Glendive[2]	7.6	9	11	13	15
Frank Wiley Field/Miles City[2]	15	21	27	33	39
Gallatin Field/Bozeman[1]	151.4	181	211	240	270
Glacier Park Int'l./Kalispell[1]	179.5	250	321	392	463
Glasgow Int'l./Glasgow[2]	15	21	26	32	38
Great Falls Int'l./Great Falls[1]	482.9	536	589	643	695
Havre City-County/Havre[2]	12	17	21	26	30
Helena Regional/Helena[1]	214.4	255	295	335	373
Johnson-Bell Field/Missoula[5]	869	1038	1206	1375	1544
Lewistown Municipal/Lewistown[2]	7.3	9	11	13	15
Sidney-Richland Municipal/Sidney[2]	36.6	44	52	60	68
Wolf Point Int'l./Wolf Point[2]	15.8	20	22	25	25
Yellowstone/West Yellowstone[1]	0.4	0.5	0.5	0.6	0.7

1 Federal Aviation Administration, Airport Activity Statistics of Certificated Route Air Carriers, (Washington, D.C.: U.S. Department of Transportation, Dec. 1985) for 1985 air-cargo estimates. Forecasts are based on same rate of increase as commercial air activity.

2 Consultant estimate based on existing and forecast operations and assumption of 20 pounds of cargo and mail enplaned on each air-taxi/commuter departure.

3 1987 estimate provided by Airport Manager, Angelo Petroni.

4 1987 estimated provided by Assistant Airport Manager, Tom Binford.

5 1985 estimate from Master Plan.

Projections for air cargo were estimated using the same growth rate for air-cargo activity as for commercial air-service operations. For instance, if the total air-carrier and air-taxi/commuter operations increased by 50%, then the air-cargo tonnage was also estimated to increase by 50%. The logic for this forecast methodology is that air-cargo patterns by airport have been established and are unlikely to vary dramatically over time. An examination of historical air-cargo statistics for the certified route air-carriers verified that this was a reasonable assumption.

B. METHODOLOGIES AND FORECASTS FOR GENERAL AVIATION AIRPORTS

1. Based Aircraft

The number of aircraft currently based at Montana airports was established from FAA's Form 5010, which was reviewed and updated during the airport inventory conducted as part of this System Plan.

Projections for based aircraft have been estimated using the assumption that based aircraft will increase at the same rate as local operations. That is, the number of local operations per based aircraft will remain constant over the planning period.

The FAA's "Terminal Area Forecasts" contains projections of local GA operations for Montana's scheduled air-service airports. The growth factors used in the TAF for local GA operations were used to develop the following annual adjustment factors for based aircraft.

Year	Growth Adjustment Factor
1987	1.00
1990	1.03
1995	1.09
2000	1.15
2005	1.20

These factors were applied to existing based aircraft to predict future based aircraft at Montana's airports.

Based aircraft forecasts are contained in Table III.4

TABLE III.4

BASED AIRCRAFT FORECASTS

Airports By County	City or Town	1987 Based Aircraft (1.00)	1990 Based Aircraft (1.03)	1995 Based Aircraft (1.09)	2000 Based Aircraft (1.15)	2005 Based Aircraft (1.20)
Beaverhead						
Dell Flight Strip	Dell	2	2	2	2	2
Dillon	Dillon	12	12	13	14	14
Wisdom	Wisdom	0	0	0	0	0
Big Horn						
Fairgrounds Airpark	Hardin	14	14	15	16	17
Yellowtail Dam	Fort Smith	0	0	0	0	0
Blaine						
Chinook Municipal	Chinook	29	30	32	33	34
Hogeland	Hogeland	2	2	2	2	2
Riggin Memorial	Harlem	11	11	12	13	13
Turner	Turner	8	8	9	9	10
Broadwater						
Canyon Ferry	Canyon Ferry	3	3	4	4	4
Townsend	Townsend	11	11	12	13	13
Carbon						
Bridger Municipal	Bridger	2	2	2	2	2
Red Lodge	Red Lodge	10	10	11	12	12
Carter						
Ekalaka	Ekalaka	6	6	7	7	7
Cascade						
Great Falls Int'l.	Great Falls	113	116	123	130	136
Chouteau						
Big Sandy	Big Sandy	16	16	17	18	19
Fort Benton	Fort Benton	18	19	20	21	22
Geraldine	Geraldine	8	8	9	9	10
Custer						
Frank Wiley Field	Miles City	35	36	38	40	42
Daniels						
East Poplar Int'l.	East Poplar	0	0	0	0	0
Scobey	Scobey	14	14	15	16	17
Dawson						
Dawson Community	Glendive	29	30	32	33	35
Richey	Richey	5	5	5	6	6
Deer Lodge						
Anaconda	Anaconda	10	10	11	12	12
Fallon						
Baker Municipal*	Baker	27	30	34	36	38
Fergus						
Denton	Denton	0	0	0	0	0
Lewistown	Lewistown	29	30	32	33	35
Winifred	Winifred	3	3	3	3	4

TABLE III.4 (CONT.)

BASED AIRCRAFT FORECASTS

Airports By County	City or Town	1987 Based Aircraft (1.00)	1990 Based Aircraft (1.03)	1995 Based Aircraft (1.09)	2000 Based Aircraft (1.15)	2005 Based Aircraft (1.20)
Flathead						
Ferndale Airpark	Bigfork	31	32	34	36	37
Glacier Park Int'l.	Kalispell	50	52	55	58	60
Kalispell City	Kalispell	59	61	64	68	71
Meadow Creek (USFS)	Meadow Creek	0	0	0	0	0
Schafer (USFS)	Ranger Station	0	0	0	0	0
Spotted Bear (USFS)	Ranger Station	0	0	0	0	0
Whitefish	Whitefish	0	0	0	0	0
Gallatin						
Gallatin Field	Bozeman	87	90	95	100	104
Three Forks	Three Forks	17	18	19	20	20
Yellowstone	West Yellowstone	3	3	3	3	4
Garfield						
Jordan	Jordan	2	2	2	2	2
Glacier						
Babb	Babb	0	0	0	0	0
Cut Bank Municipal	Cut Bank	30	31	33	35	36
Starr-Browning	Browning	0	0	0	0	0
Whetstone Int'l.	Del-Bonita	0	0	0	0	0
Golden Valley						
Lavina	Lavina	0	0	0	0	0
Ryegate	Ryegate	0	0	0	0	0
Granite						
Drummond	Drummond	3	3	3	3	4
Riddick Field	Philipsburg	7	7	8	8	8
Hill						
Havre City-County	Havre	36	37	39	41	43
Jefferson						
Boulder	Boulder	2	2	2	2	2
Judith Basin						
Stanford	Stanford	8	8	9	9	10
Lake						
Polson	Polson	17	18	19	20	20
Ronan	Ronan	8	8	9	9	10
St. Ignatius	St. Ignatius	3	3	3	3	4
Lewis & Clark						
Augusta	Augusta	0	0	0	0	0
Benchmark (USFS)	Augusta (30 mi.)	0	0	0	0	0
Helena Regional	Helena	151	156	165	174	181
Lincoln	Lincoln	4	4	4	5	5
Oxbow Ranch	Wolf Creek	0	0	0	0	0
Liberty						
Liberty County	Chester	18	19	20	21	22
Tiber Dam		0	0	0	0	0

TABLE III.4 (CONT.)

BASED AIRCRAFT FORECASTS

Airports By County	City or Town	1987 Based Aircraft (1.00)	1990 Based Aircraft (1.03)	1995 Based Aircraft (1.09)	2000 Based Aircraft (1.15)	2005 Based Aircraft (1.20)
Lincoln						
Eureka	Eureka	10	10	11	12	12
Libby	Libby	17	18	19	20	20
Troy (USFS)	Troy	1	1	1	1	1
Madison						
Big Sky Airpark*	Ennis	13	21	22	23	24
Twin Bridges	Twin Bridges	5	5	5	6	6
McCone						
Circle Town-County	Circle	10	10	11	12	12
Meagher						
White Sulphur Springs	White Sulphur Springs	5	5	5	6	6
Mineral						
Mineral County	Superior	11	11	12	13	13
Missoula						
Condon (USFS)	Condon	0	0	0	0	0
Rock Creek-Elliot	Clinton	1	1	1	1	1
Johnson-Bell Field	Missoula	139	143	152	160	167
Seeley Lake	Seeley Lake	2	2	2	2	2
Musselshell						
Roundup	Roundup	10	10	11	12	12
Park						
Gardiner	Gardiner	11	11	12	13	14
Mission Field	Livingston	19	20	21	22	23
Wilsall	Wilsall	1	1	1	1	1
Phillips						
Malta	Malta	24	25	26	28	29
Morgan (Border)	Morgan	0	0	0	0	0
Pondera						
Conrad	Conrad	15	15	16	17	18
Valier	Valier	10	10	11	12	12
Powder River						
Belle Creek	Belle Creek	4	4	4	5	5
Broadus	Broadus	3	3	3	3	4
Powell						
Deer Lodge	Deer Lodge	11	11	12	13	13
Prairie						
Terry	Terry	4	4	4	5	5
Ravalli						
Hamilton	Hamilton	50	52	55	58	60
Stevensville	Stevensville	20	21	22	23	24
Richland						
Fairview	Fairview	1	1	1	1	1
Sidney-Richland Mun.	Sidney	61	63	66	70	73

TABLE III.4 (CONT.)

BASED AIRCRAFT FORECASTS

Airports By County	City or Town	1987 Based Aircraft (1.00)	1990 Based Aircraft (1.03)	1995 Based Aircraft (1.09)	2000 Based Aircraft (1.15)	2005 Based Aircraft (1.20)
Roosevelt						
Big Sky Field	Culbertson	12	12	13	14	14
Poplar	Poplar	7	7	8	8	8
Wolf Point Int'l.	Wolf Point	24	25	26	28	29
Rosebud						
St. Labre Mission	Ashland	0	0	0	0	0
Tillitt Field	Forsyth	23	24	25	26	27
Sanders						
Hot Springs	Hot Springs	0	0	0	0	0
Plains	Plains	5	5	5	6	6
Thompson Falls	Thompson Falls	3	3	3	3	4
Sheridan						
Sher-Wood	Plentywood	26	27	28	30	31
Silver Bow						
Bert Mooney	Butte	40	41	44	46	48
Stillwater						
Columbus	Columbus	20	21	22	23	24
Sweet Grass						
Big Timber	Big Timber	11	11	12	13'	13
Teton						
Choteau	Choteau	8	8	9	9	10
Dutton	Dutton	7	7	8	8	8
Fairfield	Fairfield	8	8	9	9	10
Toole						
Ross Int'l.	Sweetgrass	0	0	0	0	0
Shelby	Shelby	21	22	23	24	25
Sunburst	Sunburst	0	0	0	0	0
Treasure						
Hysham	Hysham	3	3	3	3	4
Valley						
Glasgow Int'l.	Glasgow	33	34	36	38	40
Hinsdale	Hinsdale	3	3	3	3	4
Opheim	Opheim	1	1	1	1	1
Valley Ind. Park	Glasgow	0	0	0	0	0
Wheatland						
Harlowton	Harlowton	8	8	9	9	10
Yellowstone						
Billings-Logan Int'l.	Billings	249	256	271	286	299
Laurel Municipal	Laurel	65	67	71	75	78
STATE OF MONTANA - TOTAL:		1,988	2,057	2,180	2,300	2,400

* Forecasts from Master Plan.

2. Fleet Mix

General aviation aircraft can be classified as single-engine piston, multiple-engine piston, turbo-prop, turbo-jet, rotorcraft, or other types of aircraft such as gliders, ultralights, homebuilt craft, etc. The differing types of aircraft require different airport facilities, and the operations by type of aircraft are how airports are classified. The fleet mix by type of aircraft for existing airports was obtained from either (1) the FAA's Form 5010, (2) airport master plans, or (3) from contact with individual airports, if available information was not reasonable or conflicting.

Fleet mix was expected to remain constant over the planning period. Actual trends indicate that multiple-engine aircraft are growing faster than single-engine aircraft. However, because of the modest increase in based aircraft anticipated during the planning period, the fleet mix has been projected to remain in the same relative proportion as exists at the present time.

Existing and forecast fleet mix by airport is shown in Table III.5. Since the growth of general aviation is expected to be modest, only the forecast for the end of the planning period in the year 2005 is shown.

3. General Aviation Operations

Forecasts for general aviation operations are dependent on the number and type of based aircraft at each airport. Ramp surveys conducted at 13 airports in August of 1987 revealed that aviation activity was also dependent on whether aerial spray applicators and flight instructors were operating at a particular airport. If they were, these airports showed significantly higher operations. A formula using numbers of based aircraft, aerial applicators, and flight instructors as variables was developed to estimate general aviation operations. While significant variations at some airports did occur, this formula predicted reasonable values and was used to predict general aviation operations at airports where more precise information was not available.

General aviation operation forecasts for 15 airports were included in the FAA "Terminal Area Forecast" report and were used where they were considered reasonable. Airport master plans were also checked to see if activity was consistent with other records.

Forecasts for general aviation operations are contained in Table III.6. General aviation operation forecasts shown for the 15 scheduled air-service airports were developed using the FAA "Terminal Area Forecast" report and airport master plans. The operations at all other airports were estimated based on the number of based aircraft. Minor inconsistencies exist in the results due to the different methods used to calculate operations at the GA and the air-service airports. Therefore, caution should be used when comparing a GA airport to a scheduled air-service airport.

TABLE III.5

BASED AIRCRAFT FLEET MIX

Airports By County	City or Town	Existing (1987)							Projected (2005)						
		Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total	Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total
Beaverhead															
Dell Flight Strip	Dell	2						2	2						2
Dillon	Dillon	11	1					12	13	1					14
Wisdom	Wisdom	0						0	0						0
Big Horn															
Fairgrounds Airpark	Hardin	14						14	17						17
Yellowtail Dam	Fort Smith	0						0	0						0
Blaine															
Chinook Municipal	Chinook	29						29	34						34
Hogeland	Hogeland	2						2	2						2
Riggin Memorial	Harlem	11						11	13						13
Turner	Turner	8						8	10						10
Broadwater															
Canyon Ferry	Canyon Ferry	3						3	4						4
Townsend	Townsend	11						11	13						13
Carbon															
Bridger Municipal	Bridger	2						2	2						2
Red Lodge	Red Lodge	10						10	11	1					12
Carter															
Ekalaka	Ekalaka	8						8	7						7
Cascade															
Great Falls Int'l.	Great Falls	62	19	2	5		25	113	81	23	5	2		25	136
Chouteau															
Big Sandy	Big Sandy	15	1					16	18	1					19
Fort Benton	Fort Benton	17	1					18	21	1					22
Geraldine	Geraldine	8						8	10						10
Custer															
Frank Wiley Field	Miles City	33	2					35	40	2					42
Daniels															
East Poplar Int'l.	East Poplar	0						0	0						0
Scobey	Scobey	14						14	17						17
Dawson															
Dawson Community	Glendive	29						29	34	1					35
Richey	Richey	5						5	6						6
Deer Lodge															
Anaconda	Anaconda	10						10	12						12
Fallon															
Baker Municipal*	Baker	24	3					27	32	6					38
Fergus															
Denton	Denton	0						0	0						0
Lewistown	Lewistown	23	2		4			29	28	3		4			35
Winifred	Winifred	3						3	4						4
Flathead															
Ferndale Airpark	Bigfork	25	2	1	3			31	30	2	1	3	1		37
Glacier Park Int'l.	Kalispell	36	13			1		50	45	13	1		1		60
Kalispell City	Kalispell	54	3		2			59	66	2		3			71
Meadow Creek (USFS)	Meadow Creek	0						0							0
Schefer (USFS)	Ranger Station	0						0	0						0
Spotted Bear (USFS)	Ranger Station	0						0	0						0
Whitefish	Whitefish	0						0	0						0
Gallatin															
Gallatin Field	Bozeman	74	5	1		7		87	86	9	2		7		104
Three Forks	Three Forks	15				2		17	18				2		20
Yellowstone	West Yellowstone	3						3	4						4
Garfield															
Jordan	Jordan	2						2	2						2
Glacier															
Babb	Babb	0						0	0						0
Cut Bank Municipal	Cut Bank	26	2		2			30	32	2		2			36
Starr-Browning	Browning	0						0	0						0
Whetstone Int'l.	Del-Bonita	0						0	0						0
Golden Valley															
Lavina	Lavina	0						0	0						0
Ryegate	Ryegate	0						0	0						0

TABLE III.5 (CONT.)

BASED AIRCRAFT FLEET MIX

Airports By County	City or Town	Existing (1987)							Projected (2005)						
		Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total	Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total
Granite															
Drummond	Drummond	3						3	4						4
Riddick Field	Philipsburg	7						7	8						8
Hill															
Havre City-County	Havre	32	4					36	37	5	1				43
Jefferson															
Boulder	Boulder	2						2	2						2
Judith Basin															
Stanford	Stanford	8						8	10						10
Lake															
Polson	Polson	17						17	19	1					20
Ronan	Ronan	8						8	10						10
St. Ignatius	St. Ignatius	3						3	4						4
Lewis & Clark															
Augusta	Augusta	0						0	0						0
Benchmark (USFS)	Augusta (30 mi.)	0						0	0						0
Helena Regional	Helena	92	11		2	1	45	151	120	12		2	1	46	181
Lincoln	Lincoln	4						4	5						5
Oxbow Ranch	Wolf Creek	0						0	0						0
Liberty															
Liberty County	Chester	18						18	22						22
Tiber Dam		0						0	0						0
Lincoln															
Eureka	Eureka	9	1					10	11	1					12
Libby	Libby	15				2		17	17	1			2		20
Troy (USFS)	Troy	1						1	1						1
Madison															
Big Sky Airpark*	Ennis	12	1					13	16	8					24
Twin Bridges	Twin Bridges	5						5	8						8
McCone															
Circle Town-County	Circle	10						10	12						12
Meagher															
White Sulphur Springs	White Sulphur Springs	5						5	8						8
Mineral															
Mineral County	Superior	11						11	13						13
Missoula															
Condon (USFS)	Condon	0						0	0						0
Rock Creek-Elliot	Clinton	1						1	1						1
Johnson-Bell Field	Missoula	119	12	3	4	1		139	120	36	4	5	2		167
Seeley Lake	Seeley Lake	2						2	2						2
Musselshell															
Roundup	Roundup	10						10	12						12
Park															
Gardiner	Gardiner	10	1					11	13	1					14
Mission Field	Livingston	18	1					19	21	2					23
Wilsall	Wilsall	1						1	1						1
Phillips															
Malta	Malta	22	1		1			24	26	1		2			29
Morgan (Border)	Morgan	0						0	0						0
Pondera															
Conrad	Conrad	15						15	18						18
Valier	Valier	9	1					10	11	1					12
Powder River															
Bella Creek	Bella Creek	4						4	5						5
Broadus	Broadus	3						3	4						4
Powell															
Deer Lodge	Deer Lodge	11						11	13						13
Prairie															
Terry	Terry	4						4	5						5

TABLE III.5 (CONT.)

BASED AIRCRAFT FLEET MIX

Airports By County	City or Town	Existing (1987)							Projected (2005)						
		Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total	Single-Engine	Multi-Engine	Turbo-Jet	Rotor-Craft	Other	Military	Total
Ravalli															
Hamilton	Hamilton	47	2				1	50	55	3				2	60
Stevensville	Stevensville	20						20	24						24
Richland															
Fairview	Fairview	1						1	1						1
Sidney-Richland Mun.	Sidney	57	3		1			61	67	5		1			73
Roosevelt															
Big Sky Field	Culbertson	12						12	14						14
Poplar	Poplar	6	1					7	7	1					8
Wolf Point Int'l.	Wolf Point	23	1					24	26	1					29
Rosebud															
St. Labre Mission	Ashland	0						0	0						0
Tillitt Field	Forsyth	23						23	27						27
Sanders															
Hot Springs	Hot Springs	0						0	0						0
Plains	Plains	5						5	8						8
Thompson Falls	Thompson Falls	3						3	4						4
Sheridan															
Sher-Wood	Plentywood	26						26	31						31
Silver Bow															
Bert Mooney	Butte	36	4					40	44	4					48
Stillwater															
Columbus	Columbus	19				1		20	23				1		24
Sweet Grass															
Big Timber	Big Timber	11						11	13						13
Teton															
Choteau	Choteau	8						8	10						10
Dutton	Dutton	7						7	8						7
Fairfield	Fairfield	8						8	10						10
Toole															
Ross Int'l.	Sweetgrass	0						0	0						0
Shelby	Shelby	20	1					21	24	1					25
Sunburst	Sunburst	0						0	0						0
Treasure															
Hysham	Hysham	3						3	4						4
Valley															
Glasgow Int'l.	Glasgow	32	1					33	39	1					40
Hinsdale	Hinsdale	3						3	4						4
Opheim	Opheim	1						1	1						1
Valley Ind. Park	Glasgow	0						0	0						0
Wheatland															
Harlowton	Harlowton	8						8	10						10
Yellowstone															
Billings-Logan Int'l.	Billings	192	55	1	1			249	231	61	3	4			299
Laurel Municipal	Laurel	58	3		1	3		65	70	4		1	3		78
STATE OF MONTANA - TOTAL:		1,707	158	8	26	18	71	1,988	2,044	217	17	29	20	73	2,400

*Forecasts from Master Plan.

TABLE III.6

FORECASTS FOR GENERAL AVIATION OPERATIONS

Airports by County	City or Town	1987 GA Operations (1.00)[1]				2005 GA Operations (1.20)[2]			
		Based Aircraft	Local	Itinerant[3]	Total	Based Aircraft	Local	Itinerant[3]	Total
Beaverhead									
Dell Flight Strip	Dell	2	844	506	1,350	2	1,013	608	1,620
Dillon	Dillon	12	2,012	1,938	3,950	14	2,414	2,326	4,740
Wisdom	Wisdom	0	0	60	60	0	0	72	72
Big Horn									
Fairgrounds Airpark	Hardin	14	3,571	1,479	5,050	17	4,285	1,775	6,060
Yellowtail Dam	Fort Smith	0	0	350	350	0	0	420	420
Blaine									
Chinook Municipal	Chinook	29	4,487	3,038	7,525	34	5,384	3,646	9,030
Hogeland	Hogeland	2	300	100	40	2	360	120	480
Riggin Memorial	Harlem	11	1,462	1,46	3 2,925	13	1,754	1,755	3,510
Turner	Turner	8	2,150	600	2,750	10	2,580	720	3,300
Broadwater									
Canyon Ferry	Canyon Ferry	3	245	105	350	4	294	126	420
Townsend	Townsend	11	1,812	1,463	3,275	13	2,174	1,756	3,930
Carbon									
Bridger Municipal	Bridger	2	1,160	540	1,700	2	1,392	648	2,040
Red Lodge	Red Lodge	10	1,587	1,098	2,685	7	1,742	1,318	3,660
Carter									
Ekalaka	Ekalaka	6	1,452	1,098	2,550	7	1,742	1,318	3,060
Cascade									
Great Falls Int'l.	Great Falls[4]	113	15,000	23,400	38,400	136	23,400	36,600	60,000
Chouteau									
Big Sandy	Big Sandy	16	3,512	1,188	4,700	19	4,214	1,426	5,640
Fort Benton	Fort Benton	18	2,748	1,902	4,650	22	3,298	2,282	5,580
Geraldine	Geraldine	8	3,320	480	3,800	10	3,984	576	4,560
Custer									
Frank Wiley Field	Miles City[4]	35	7,000	13,000	20,000	42	8,900	16,600	25,500
Daniels									
East Poplar Int'l.	East Poplar	0	0	200	200	0	0	240	240
Scobey	Scobey	14	1,979	1,971	3,950	17	2,375	2,365	4,740
Dawson									
Dawson Community	Glendive[4]	29	1,460	3,650	5,110	35	2,200	4,400	6,600
Richey	Richey	5	1,405	820	2,225	6	1,686	984	1,470
Deer Lodge									
Anaconda	Anaconda	10	1,400	1,650	3,050	12	1,680	1,980	3,660
Fallon									
Baker Municipal	Baker	27	3,823	2,602	6,425	38	4,588	3,122	7,110

TABLE III.6

FORECASTS FOR GENERAL AVIATION OPERATIONS

Airports by County	City or Town	1987 GA Operations (1.00)[1]				2005 GA Operations (1.20)[2]			
		Based Aircraft	Local	Itinerant[3]	Total	Based Aircraft	Local	Itinerant[3]	Total
Fergus									
Denton	Denton	0	100	150	250	0	120	180	300
Lewistown	Lewistown[4]	29	5,000	11,000	16,000	35	6,200	13,900	20,100
Winifred	Winifred	3	500	200	700	4 60	0	240	840
Flathead									
Ferndale Airpark	Bigfork	31	4,498	2,677	7,175	37	5,398	3,212	8,610
Glacier Park Int'l.	Kalispell[4]	50	11,000	16,600	27,600	60	13,000	19,800	32,800
Kalispell City	Kalispell	59	6,916	5,909	12,825	71	8,299	7,091	15,390
Meadow Creek (USFS)	Meadow Creek	0	0	175	175	0	0	210	210
Schafer (USFS)	Ranger Station	0	0	150	150	0	0	180	180
Spotted Bear (USFS)	Ranger Station	0	0	150	150	0	0	180	180
Whitefish	Whitefish	0	0	500	500	0	0	600	600
Gallatin									
Gallatin Field	Bozeman[4]	87	23,900	6,700	30,600	104	29,000	8,000	37,000
Three Forks	Three Forks	17	2,300	1,825	4,125	20	2,760	2,190	4,950
Yellowstone	West Yellowstone[4]	3	500	4,000	4,500	4	1,000	5,000	6,000
Garfield									
Jordan	Jordan	2	1,325	675	2,000	2	1,590	810	2,400
Glacier									
Babb	Babb	0	0	300	300	0	0	360	360
Cut Bank Municipal	Cut Bank	30	4,078	3,472	7,500	36	4,894	4,166	9,000
Starr-Browning	Browning	0	0	400	400	0	0	480	480
Whetstone Int'l.	Del-Bonita	0	0	200	200	0	0	240	240
Golden Valley									
Lavina	Lavina	0	0	120	120	0	0	144	144
Ryegate	Ryegate	0	0	150	150	0	0	180	180
Granite									
Drummond	Drummond	3	50	100	150	4	60	120	180
Riddick Field	Philipsburg	7	1,112	1,113	2,225	8	1,334	1,336	2,670
Hill									
Havre City-County	Havre[4]	36	5,000	12,000	17,000	43	6,400	15,300	21,700
Jefferson									
Boulder	Boulder	2	923	727	1,650	2	1,108	872	1,980
Judith Basin									
Stanford	Stanford	8	2,196	554	2,750	10	2,635	665	3,300

TABLE III.6

FORECASTS FOR GENERAL AVIATION OPERATIONS

Airports by County	City or Town	1987 GA Operations (1.00)[1] Based Aircraft	Local	Itinerant[3]	Total	2005 GA Operations (1.20)[2] Based Aircraft	Local	Itinerant[3]	Total
Lake									
Polson	Polson	17	3,069	2,056	5,125	20	3,683	2,467	6,150
Ronan	Ronan	8	1,889	1,011	2,900	10	2,267	1,213	3,480
St. Ignatius	St. Ignatius	3	1,421	254	1,675	4	1,705	305	2,010
Lewis & Clark									
Augusta	Augusta	0	0	200	200	0	0	240	240
Benchmark (USFS)	Augusta (30 mi.)	0	0	200	200	0	0	240	240
Helena Regional	Helena[4]	151	12,000	21,000	33,000	181	14,700	30,200	44,900
Lincoln	Lincoln	10	1,100	1,650	2,750	12	1,320	1,980	3,300
Oxbow Ranch	Wolf Creek	0	0	200	200	0	0	240	240
Liberty									
Liberty County	Chester	18	3,076	2,174	5,250	22	3,691	2,609	6,300
Tiber Dam		0	0	200	200	0	0	240	240
Lincoln									
Eureka	Eureka	10	1,100	1,650	2,750	12	1,320	1,980	3,300
Libby	Libby	17	2,535	1,590	4,125	20	3,042	1,908	4,950
Troy (USFS)	Troy	1	150	350	500	1	180	420	600
Madison									
Big Sky Airpark	Ennis	13	1,812	1,763	3,575	24	2,174	2,116	4,290
Twin Bridges	Twin Bridges	5	1,172	703	1,875	6	1,406	844	2,250
McCone									
Circle Town-Country	Circle	10	1,650	1,650	3,300	12	1,980	1,980	3,960
Meagher									
White Sulphur Springs	White Sulphur Springs	5	1,002	1,023	2,025	6	1,202	1,228	2,430
Mineral									
Mineral County	Superior	11	2,439	836	3,275	13	2,927	1,003	3,930
Missoula									
Condon (USFS)	Condon	0	0	250	250	0	0	300	300
Rock Creek-Elliot	Clinton	1	50	200	250	1	60	240	300
Johnson-Bell Field	Missoula[4]	139	22,500	31,000	53,500	167	30,800	42,500	73,300
Seeley Lake	Seeley Lake	2	76	1,274	1,350	2	92	1,528	1,620
Musselshell									
Roundup	Roundup	10	3,092	458	3,550	12	3,710	550	4,260
Park									
Gardiner	Gardiner	11	1,546	1,529	3,075	14	1,855	1,835	3,690
Mission Field	Livingston	19	2,835	2,290	5,125	23	3,402	2,748	6,150
Wilsall	Wilsall	1	75	200	275	1	90	240	330

TABLE III.6

FORECASTS FOR GENERAL AVIATION OPERATIONS

Airports by County	City or Town	1987 GA Operations (1.00[1]				2005 GA Operations (1.20[2]			
		Based Aircraft	Local	Itinerant[3]	Total	Based Aircraft	Local	Itinerant[3]	Total
Phillips									
Malta	Malta	24	4,223	2,427	6,650	29	5,068	2,912	7,980
Morgan (Border)	Morgan	0	0	200	200	0	0	240	240
Pondera									
Conrad	Conrad	15	3,139	1,036	4,175	18	3,767	1,243	5,010
Valier	Valier	10	2,692	2,800	5,492	12	3,230	3,360	6,590
Powder River									
Belle Creek	Belle Creek	4	300	400	700	5	360	480	840
Broadus	Broadus	3	1,043	832	1,875	4	1,252	998	2,250
Powell									
Deer Lodge	Deer Lodge	11	1,595	1,330	2,925	13	1,915	1,595	3,510
Prairie									
Terry	Terry	4	787	1,063	1,850	5	944	1,276	2,220
Ravalli									
Hamilton	Hamilton	50	3,246	7,304	10,550	60	3,895	8,765	12,660
Stevensville	Stevensville	20	3,189	1,761	4,950	24	3,827	2,113	5,940
Richland									
Fairview	Fairview	1	480	120	600	1	576	144	720
Sidney-Richland Mun.	Sidney[4]	61	7,000	11,000	18,000	73	9,400	12,900	22,300
Roosevelt									
Big Sky Field	Culbertson	12	2,110	1,740	3,850	14	2,532	2,088	4,620
Poplar	Poplar	7	2,148	727	2,875	8	2,578	872	3,450
Wolf Point Int'l.	Wolf Point[4]	24	1,750	8,500	10,250	29	2,000	11,000	13,000
Rosebud									
St. Labre Mission	Ashland	0	0	450	450	0	0	540	540
Tillitt Field	Forsyth	23	2,884	2,741	5,625	27	3,461	3,289	6,750
Sanders									
Hot Springs	Hot Springs	0	150	250	400	0	180	300	480
Plains	Plains	5	1,474	551	2,025	6	1,769	661	2,430
Thompson Falls	Thompson Falls	3	1,017	508	1,525	4	1,220	610	1,830
Sheridan									
Sher-Wood	Plentywood	26	3,359	3,241	6,600	31	4,031	3,889	7,920
Silver Bow									
Bert Mooney	Butte[4]	40	5,500	7,700	13,200	48	8,000	9,000	17,000
Stillwater									
Columbus	Columbus	20	2,871	1,929	4,800	24	3,445	2,315	5,760
Sweet Grass									
Big Timber	Big Timber	11	2,832	593	3,425	13	3,398	712	4,110

TABLE III.6

FORECASTS FOR GENERAL AVIATION OPERATIONS

Airports by County	City or Town	1987 GA Operations (1.00)[1] Based Aircraft	Local	Itinerant[3]	Total	2005 GA Operations (1.20)[2] Based Aircraft	Local	Itinerant[3]	Total
Teton									
Choteau	Choteau	8	2,400	400	2,800	10	2,880	480	3,360
Dutton	Dutton	7	2,612	513	3,125	8	3,134	616	3,750
Fairfield	Fairfield	8	2,270	480	2,750	10	2,724	576	3,300
Toole									
Ross Int'l.	Sweetgrass	0	0	200	200	0	0	240	240
Shelby	Shelby	21	4,936	1,039	5,975	25	5,923	1,247	7,170
Sunburst	Sunburst	0	0	200	200	0	0	240	240
Treasure									
Hysham	Hysham	3	250	150	400	4	300	180	480
Valley									
Glasgow Int'l.	Glasgow[4]	33	7,000	15,000	22,000	40	8,600	17,600	26,200
Hinsdale	Hinsdale	3	300	300	600	4	360	360	720
Opheim	Opheim	1	100	200	300	1	120	240	360
Valley Ind. Park	Glasgow	0	0	1,000	1,000	0	0	1,200	1,200
Wheatland									
Harlowton	Harlowton	8	2,000	400	2,400	10	2,400	480	2,880
Yellowstone									
Billings-Logan Int'l.	Billings[4]	249	33,045	45,305	78,350	299	46,000	105,000	151,000
Laurel Municipal	Laurel	65	5,975	12,025	18,000	78	7,170	14,430	21,600
STATE OF MONTANA - TOTAL:		1,988	311,141	346,465	656,557	2,400	393,784	487,732	880,256

1 General Aviation operations estimated from the formula GA operations = 1,000 + 175 (no. of based aircraft) + 200 (no. of active aerial applications) + 150 (no. of active flight instructors). This formula was based on the results of the ramp surveys taken in August of 1987.

2 Forecast factors for General Aviation operations to the year 2005 extrapolated from "Terminal Area Forecasts FY 1987-2000", U.S. Department of Transportation, Federal Aviation Administration, April 1987.

3 Total operations separated into local and itinerant operations based on percent of operations that are local and itinerant from FAA's Form 5010.

4 Operations forecast for all scheduled air-service airports taken from Table III.2.

4. General Aviation Enplaned Passengers

The ramp surveys conducted in August, 1987 on 13 airports in Montana showed an average enplanement of 1.91 passengers per itinerant GA departure. To estimate general aviation enplanements, the itinerant operations in Table III.6 were assumed to be 50% arrivals and 50% departures. Enplaned passengers were, therefore, computed by dividing the itinerant operations by 2 to determine itinerant departures and multiplying by 1.91 passengers per itinerant departure to arrive at an estimate of general aviation enplaned passengers.

$$\text{Enplaned Passengers} = \frac{\text{GA Itin. Oper.}}{\text{2 Oper/Dep.}} \quad (1.91 \text{ Passengers/Itin. Dep.})$$

Table III.7 shows the GA enplaned passengers by airport. Since the growth is modest, only the existing conditions (1987) and the year 2005 forecasts are shown.

5. Military Aviation Operations

Forecasts for military aviation operations in Montana are contained in the FAA Publication "Terminal Area Forecasts, FY 1987-2000." This reference shows historical and projected military aviation operations at Montana's air-carrier airports and is the most current reference available. The terminal area forecast for military aviation operations indicates no change in the volume of operations will occur during the forecast period.

Based on this information, it is assumed the trend of no growth will continue for the 2000-2005 year period. It is also assumed that an identical trend of no growth will occur in military activity at Montana's General Aviation airports.

The forecast of military aviation operations in Montana are shown by airport in Table III.8. Only the airports with reported military activity have been included in the table.

TABLE III.7

FORECASTS FOR GENERAL AVIATION ENPLANED PASSENGERS

Airports or County	City or Town	Existing (1987) Itinerant Departures	Existing (1987) Enplaned Passengers	Forecast (2005) Itinerant Departures	Forecast (2005) Enplaned Passengers
Beaverhead					
Dell Flight Strip	Dell	253	483	304	580
Dillon	Dillon	1,234	2,358	1,481	2,829
Wisdom	Wisdom	30	57	36	69
Big Horn					
Fairgrounds Airpark	Hardin	1,082	2,067	1,299	2,480
Yellowtail Dam	Fort Smith	175	334	210	401
Blaine					
Chinook Municipal	Chinook	1,882	3,594	2,258	4,312
Hogeland	Hogeland	50	96	60	115
Riggin Memorial	Harlem	731	1,397	878	1,676
Turner	Turner	344	656	413	788
Broadwater					
Canyon Ferry	Canyon Ferry	53	100	63	120
Townsend	Townsend	819	1,564	983	1,8774
Carbon					
Bridger Municipal	Bridger	340	649	408	779
Red Lodge	Red Lodge	811	1,549	973	1,859
Carter					
Ekalaka	Ekalaka	683	1,305	820	1,566
Cascade					
Great Falls Int'l.	Great Falls	11,700	22,347	18,300	34,953
Chouteau					
Big Sandy	Big Sandy	734	1,403	881	1,683
Fort Benton	Fort Benton	1,066	2,035	1,279	2,442
Geraldine	Geraldine	380	726	456	871
Custer					
Frank Wiley Field	Miles City	6,500	12,415	8,300	15,853
Daniels					
East Poplar Int'l.	East Poplar	100	191	120	229
Scobey	Scobey	1,129	2,156	1,354	2,587
Dawson					
Dawson Community	Glendive	1,825	3,486	2,200	4,202
Richey	Richey	268	512	322	614
Deer Lodge					
Anaconda	Anaconda	915	1,748	1,098	2,097
Fallon					
Baker Municipal	Baker	1,460	2,789	1,940	3,705
Fergus					
Denton	Denton	75	143	90	172
Lewistown	Lewistown	5,500	10,505	6.850	13,275
Winifred	Winifred	100	191	120	229

TABLE III.7

FORECASTS FOR GENERAL AVIATION ENPLANED PASSENGERS

Airports or County	City or Town	Existing (1987) Itinerant Departures	Existing (1987) Enplaned Passengers	Forecast (2005) Itinerant Departures	Forecast (2005) Enplaned Passengers
Flathead					
Ferndale Airpark	Bigfork	1,495	2,855	1,794	3,426
Glacier Park Int'l.	Kalispell	8,300	15,853	9,900	18,909
Kalispell City	Kalispell	3,346	6,390	4,015	7,668
Meadow Creek (USFS)	Meadow Creek	63	119	75	143
Schafer (USFS)	Ranger Station	88	167	105	201
Spotted Bear (USFS)	Ranger Station	75	143	90	172
Whitefish	Whitefish	250	478	300	573
Gallatin					
Gallatin Field	Bozeman	3,350	6,399	4,000	7,640
Three Forks	Three Forks	947	1,808	1,136	2,170
Yellowstone	West Yellowstone	2,000	3,820	2,500	4,775
Garfield					
Jordan	Jordan	500	955	600	1,146
Glacier					
Babb	Babb	150	287	180	344
Cut Bank Municipal	Cut Bank	2,083	3,979	2,500	2,775
Starr-Browning	Browning	200	382	240	458
Whetstone Int'l.	Del-Bonita	100	191	120	229
Golden Valley					
Lavina	Lavina	60	115	72	138
Ryegate	Ryegate	75	143	90	172
Granite					
Drummond	Drummond	50	96	60	115
Riddick Field	Philipsburg	557	1,063	668	1,275
Hill					
Havre City-County	Havre	6,000	11,460	7,650	14,612
Jefferson					
Boulder	Boulder	444	848	553	1,018
Judith Basin					
Stanford	Stanford	317	606	381	727
Lake					
Polson	Polson	1,325	2,532	1,591	3,038
Ronan	Ronan	611	1,166	733	1,399
St. Ignatius	St. Ignatius	140	267	168	320
Lewis & Clark					
Augusta	Augusta	100	0191	120	229
Benchmark (USFS)	Augusta (30 mi.)	100	191	120	229
Helena Regional	Helena	10,500	20,055	15,100	28,841
Lincoln	Lincoln	677	1,294	813	1,553
Oxbow Ranch	Wolf Creek	75	143	90	172
Liberty					
Liberty County	Chester	1,375	2,626	1,650	3,152
Tiber Dam		100	191	120	229

TABLE III.7

FORECASTS FOR GENERAL AVIATION ENPLANED PASSENGERS

Airports or County	City or Town	Existing (1987) Itinerant Departures	Existing (1987) Enplaned Passengers	Forecast (2005) Itinerant Departures	Forecast (2005) Enplaned Passengers
Lincoln					
Eureka	Eureka	825	1,576	990	1,891
Libby	Libby	825	1,576	990	1,891
Troy (USFS)	Troy	175	334	210	401
Madison					
Big Sky Airpark	Ennis	963	1,838	1,480	2,827
Twin Bridges	Twin Bridges	352	671	422	806
McCone					
Circle Town-Country	Circle	990	1,891	1,188	2,269
Meagher					
White Sulphur Springs	White Sulphur Springs	552	1,055	663	1,266
Mineral					
Mineral County	Superior	468	894	561	1,072
Missoula					
Condon (USFS)	Condon	125	239	150	287
Rock Creek-Elliot	Clinton	100	191	120	229
Johnson-Bell Field	Missoula	15,500	29,605	21,250	40,588
Seeley Lake	Seeley Lake	637	1,216	764	1,460
Musselshell					
Roundup	Roundup	296	565	355	678
Park					
Gardiner	Gardiner	765	1,461	928	1,772
Mission Field	Livingston	1,357	2,591	1,628	3,109
Wilsall	Wilsall	100	191	120	229
Phillips					
Malta	Malta	1,552	2,964	1,862	3,556
Morgan (Border)	Morgan	100	191	120	229
Pondera					
Conrad	Conrad	596	1,139	716	1,367
Valier	Valier	1,400	2,674	1,680	3,209
Powder River					
Belle Creek	Belle Creek	200	382	240	458
Broadus	Broadus	511	977	614	1,172
Powell					
Deer Lodge	Deer Lodge	665	1,270	798	1,524
Prairie					
Terry	Terry	578	1,104	694	1,325
Ravalli					
Hamilton	Hamilton	3,952	7,547	4,742	9,057
Stevensville	Stevensville	5,500	10,505	6,450	12,320
Richland					
Fairview	Fairview	60	115	72	138
Sidney-Richland Mun.	Sidney	5,500	10,505	6,450	12,320

TABLE III.7

FORECASTS FOR GENERAL AVIATION ENPLANED PASSENGERS

Airports or County	City or Town	Existing (1987) Itinerant Departures	Existing (1987) Enplaned Passengers	Forecast (2005) Itinerant Departures	Forecast (2005) Enplaned Passengers
Roosevelt					
Big Sky Field	Culbertson	1,081	2,064	1,297	2,477
Poplar	Poplar	470	898	564	1,077
Wolf Point Int'l.	Wolf Point	4,250	8,118	5,500	10,505
Rosebud					
St. Labre Mission	Ashland	225	430	270	516
Tillitt Field	Forsyth	1,534	2,930	1,841	3,516
Sanders					
Hot Springs	Hot Springs	125	239	150	287
Plains	Plains	298	569	357	683
Thompson Falls	Thompson Falls	254	485	305	583
Sheridan					
Sher-Wood	Plentywood	1,927	3,680	2,312	4,416
Silver Bow					
Bert Mooney	Butte	3,850	7,354	4,500	8,595
Stillwater					
Columbus	Columbus	1,029	1,965	1,234	2,357
Sweet Grass					
Big Timber	Big Timber	347	663	417	796
Teton					
Choteau	Choteau	233	446	280	535
Dutton	Dutton	361	689	433	826
Fairfield	Fairfield	275	525	330	630
Toole					
Ross Int'l.	Sweetgrass	100	191	120	229
Shelby	Shelby	664	1,268	797	1,522
Sunburst	Sunburst	100	191	120	229
Treasure					
Hysham	Hysham	75	143	90	172
Valley					
Glasgow Int'l.	Glasgow	7,500	14,325	8,800	16,808
Hinsdale	Hinsdale	150	287	180	344
Opheim	Opheim	100	191	120	229
Valley Ind. Park	Glasgow	500	955	600	1,146
Wheatland					
Harlowton	Harlowton	200	382	240	458
Yellowstone					
Billings-Logan Int'l.	Billings	22,653	43,267	52,500	100,275
Laurel Municipal	Laurel	6,013	11,484	7,215	13,781
STATE OF MONTANA - TOTAL:		180,112	344,015	252,644	482,550

TABLE III.8

FORECAST OF MILITARY AVIATION OPERATIONS[1]

County	Airport	1986 Operations	2005 Operations
Beaverhead	Dillon	250	250
Broadwater	Canyon Ferry	150	150
	Townsend	500	500
Carbon	Red Lodge	100	100
Cascade	Great Falls Int'l.	9,248[2]	9,248
Dawson	Dawson Community	15	15
Fergus	Lewistown Municipal	700	700
Flathead	Kalispell City	100	100
	Glacier Park Int'l.	50	50
Gallatin	Gallatin Field	400	400
	Yellowstone	20	20
Glacier	Cut Bank Municipal	100	100
Hill	Havre City-County	48	48
Lewis & Clark	Benchmark	10	10
	Helena Regional	10,023[2]	10,023
	Lincoln	100	100
	Oxbow Ranch	50	50
Missoula	Johnson-Bell Field	262[2]	262
Park	Mission Field	75	75
Phillips	Malta	25	25
Pondera	Conrad	20	20
Powell	Deer Lodge City-County	600	600
Prairie	Terry	30	30
Roosevelt	Big Sky Field	30	30
Rosebud	Tillitt Field	12	12
Sheridan	Sherwood	10	10
Silver Bow	Bert Mooney	244	244
Valley	Glasgow Int'l.	100	100
Wheatland	Harlowton	75	75
Yellowstone	Billings-Logan Int'l.	882[2]	882
Total State of Montana		22,229	22,229

1 FAA 5010-1, Airport Master Records were the primary source of the military operations data. Exceptions are noted below.

2 FAA, Air Traffic Activity, FY 1986.

3 According to the Air Traffic Activity Records for FY 1986, only Billings-Logan Int'l., Great Falls Int'l., Helena Regional Airport, and Johnson-Bell recorded instrument approaches for military operations.

Chapter IV

Demand/Capacity Analysis

CHAPTER IV: DEMAND/CAPACITY ANALYSIS

A. AIRPORT CAPACITY

The ability of an airport to fulfill the demand placed upon it from aviation activity by providing adequate capacity is the basis of measure for evaluating existing airport facilities. The technique used for this analysis is to determine the capacity of an airfield and then compare the existing and forecast activity to the capacity. If the capacity is sufficient to handle the demand, the airfield has adequate facilities. If not, the airport is deficient and may require additional facilities to increase the capacity.

Capacity, as defined by the FAA, is a measure of the maximum number of aircraft operations that can be accommodated on an airport or airport component in an hour. The FAA suggests that airport design be based on an hourly demand which can be expected to occur on a weekly basis to avoid data which may represent a sporadic level of activity. For capacity analysis the FAA's "Airport Capacity and Delay" advisory circular AC:150/5060-5 was used.

The two primary measures of capacity are hourly capacity and service volume. Hourly capacity is defined as the maximum number of aircraft operations (landings and takeoffs) that can take place in an hour. As demand approaches capacity, individual aircraft delay will be increased. Successive hourly demands which exceed the hourly capacity will result in unacceptable delays. To avoid excessive delays the number of operations on all components of an airfield should be less than the capacity.

Annual Service Volume (ASV) is a measurable estimate of an airport's annual capacity. The annual service volume accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time.

B. SCHEDULED AIR-SERVICE AIRPORT CAPACITY

There are 15 airports that provide scheduled air service in the state of Montana.

Airfield capacities were calculated using the FAA's procedures. The FAA method uses each airport's meteorology, runway configuration, touch and go percentage, and operational fleet mix to determine the airfield's overall weighted capacity. This weighted capacity was then multiplied against current airport peaking characteristics to determine the annual service volume for each airfield.

Peak hour VFR operations were developed from the annual forecast (year 2005). The annual number of operations was divided by 365 to yield the average daily

operations. For the purposes of this capacity analysis, it was assumed that 25% of the total daily operations would occur during the peak hour.

The published data on IFR operations in Montana was difficult to interpret due to inconsistencies in reporting practices throughout the state. The IFR operations used in this plan were developed based on annual operations forecasts. Personnel from various flight service stations, airport control towers, and air-taxi businesses were contacted in an effort to estimate the number of IFR operations as a percentage of the total operations. The following factors were used:

	% IFR of Total Operations
Air Carrier	100%
Air-Taxi Commuter	85%
Itinerant Military (Helicopter)	25%
Itinerant Military (Jet)	90%
Itinerant GA	10%
Local Military	0%
Local GA	0%

These factors were applied to the year 2005 forecast of operations for each of the scheduled air-service airports. The annual number of IFR operations was factored to represent the peak hour by the same method used for the VFR operations.

A summary of the capacity analysis is shown in Table IV.1. As can be seen from the table, none of the scheduled air-service airports will exceed the airfield capacity through the planning period. Billings is anticipated to be the only airport to approach capacity with the peak hour IFR operations estimated at 90% of the IFR hourly capacity in the year 2005.

C. GENERAL AVIATION AIRPORT CAPACITY

General Aviation is defined as all civil aircraft operations not classified as air-carrier, air-taxi, commuter or military operations. This includes flying for pleasure, business, or training. The majority of aviation traffic within the state of Montana is general aviation. Thus, the majority of airports in the Montana State System Plan are designed and constructed for the purpose of providing facilities and services to general aviation aircraft. There are 103 general aviation airports in the state of Montana. These 103 airports provide the airfield characteristics capable of accommodating the state's general aviation fleet mix activity.

TABLE IV.1

SCHEDULED AIR-SERVICE AIRPORT CAPACITY

Airport	Annual Operations		VFR Operations		IFR Operations	
	Forecast	ASV	Pk. Hour	Hour Cap.	Pk. Hour	Hour Cap.
Billings-Logan Int'l./Billings*	198,500	350,000	71	197	53	59
Gallatin Field/Bozeman	71,100	195,000	49	74	21	57
Bert Mooney/Butte	41,400	195,000	28	74	15	57
Great Falls Int'l./Great Falls*	85,400	210,000	60	98	42	59
Helena Regional/Helena	80,600	230,000	55	98	19	59
Glacier Park Int'l./Kalispell	65,250	195,000	45	74	21	57
Johnson-Bell Field/Missoula*	92,250	265,000	76	98	50	59
Yellowstone/W. Yellowstone	7,000	230,000	5	98	2	59
Glasgow Int'l./Glasgow	35,800	170,000	25	87	8	26
Lewistown Municipal/Lewistown	28,100	170,000	19	87	6	26
Dawson Community/Glendive	9,600	116,000	7	59	2	20
Frank Wiley Field/Miles City	32,500	170,000	22	87	4	26
Sidney-Richland Muni./Sidney	43,000	170,000	29	87	13	26
Havre City-County/Havre	31,250	161,000	21	82	7	20
Wolf Point Int'l./Wolf Point	18,000	116,000	12	59	4	20

*ASV from Master Plans.

The number of average daily operations was determined by dividing the total annual operations by 365. It was assumed that 25% of the average daily operations would occur during the peak hour, and it was assumed that number of peak-hour operations would be 2 or greater at all locations.

Forecasts for peak-hour operations for general aviation airports are shown in Table IV. 2 on the following pages.

The minimum VFR capacity for a single runway airport is 40 operations per hour (Fig. 4-26 "Airport Capacity and Delay"). As can be seen in Table IV.2, none of the general aviation airports are forecast to exceed 40 operations per hour during the next 20 years. Therefore, it is concluded that all of the general aviation airports in Montana have adequate capacity throughout the planning period.

TABLE IV.2

GENERAL AVIATION PEAK HOUR OPERATIONS

Airports by County	City or Town	Annual Operations		Average Day		Peak Hour Operations	
		1987	2005	1987	2005	1987	2005
Beaverhead							
Dell Flight Strip	Dell	1,350	1,620	4	4	2	2
Dillon	Dillon	3,950	4,740	11	13	3	3
Wisdom	Wisdom	60	72	0	0	2	2
Big Horn							
Fairgrounds Airpark	Hardin	5,500	6,060	14	17	3	4
Yellowtail Dam	Fort Smith	350	420	1	1	2	2
Blaine							
Chinook Municipal	Chinook	7,525	9,030	21	25	5	6
Hogeland	Hogeland	400	480	1	1	2	2
Riggin Memorial	Harlem	2,925	3,510	8	10	2	2
Turner	Turner	2,750	3,300	8	9	2	2
Broadwater							
Canyon Ferry	Canyon Ferry	350	420	1	1	2	2
Townsend	Townsend	3,275	3,930	9	11	2	3
Carbon							
Bridger Municipal	Bridger	1,700	2,040	5	6	2	2
Red Lodge	Red Lodge	3,050	3,660	8	10	2	3
Carter							
Ekalaka	Ekalaka	2,550	3,060	7	8	2	2
Cascade							
Great Falls Int'l.	Great Falls	38,400	60,000	105	164	26	41
Chouteau							
Big Sandy	Big Sandy	4,700	5,640	13	15	3	4
Fort Benton	Fort Benton	4,650	5,580	13	15	3	4
Geraldine	Geraldine	3,800	5,460	10	12	3	3
Custer							
Frank Wiley Field	Miles City	20,000	25,500	55	70	14	17
Daniels							
East Poplar Int'l.	East Poplar	200	240	1	1	2	2
Scobey	Scobey	3,950	4,740	11	13	3	3
Dawson							
Dawson Community	Glendive	5,110	6,600	14	18	4	5
Richey	Richey	1,225	1,470	3	4	2	2
Deer Lodge							
Anaconda	Anaconda	3,050	3,660	8	10	2	3
Fallon							
Baker Municipal	Baker	6,425	8,350	18	23	4	6
Fergus							
Denton	Denton	250	300	1	1	2	2
Lewistown	Lewistown	16,000	20,100	44	55	11	14
Winifred	Winifred	700	840	2	2	2	2

TABLE IV.2

GENERAL AVIATION PEAK HOUR OPERATIONS

Airports by County	City or Town	Annual Operations		Average Day		Peak Hour Operations	
		1987	2005	1987	2005	1987	2005
Flathead							
Ferndale Airpark	Bigfork	7,175	8,610	20	24	5	6
Glacier Park Int'l.	Kalispell	27,600	32,800	76	90	19	22
Kalispell City	Kalispell	12,825	15,390	35	42	9	11
Meadow Creek (USFS)	Meadow Creek	125	150	0	0	2	2
Schafer (USFS)	Ranger Station	175	210	0	1	2	2
Spotted Bear (USFS)	Ranger Station	150	180	0	0	2	2
Whitefish	Whitefish	500	600	1	2	2	2
Gallatin							
Gallatin Field	Bozeman	30,600	37,000	84	101	21	25
Three Forks	Three Forks	4,125	4,950	11	14	3	3
Yellowstone	West Yellowstone	4,500	6,000	12	16	3	4
Garfield							
Jordan	Jordan	2,000	2,400	5	7	2	2
Glacier							
Babb	Babb	300	360	1	1	2	2
Cut Bank Municipal	Cut Bank	7,500	9,000	21	25	5	6
Starr-Browning	Browning	400	480	1	1	2	2
Whetstone Int'l.	Del-Bonita	200	240	1	1	2	2
Golden Valley							
Lavina	Lavina	120	144	0	0	2	2
Ryegate	Ryegate	2,225	2,670	6	7	2	2
Granite							
Drummond	Drummond	150	180	0	0	2	2
Riddick Field	Philipsburg	2,225	2,670	6	7	2	2
Hill							
Havre City-County	Havre	17,000	21,700	47	59	12	15
Jefferson							
Boulder	Boulder	1,650	1,980	5	5	2	2
Judith Basin							
Stanford	Stanford	2,750	3,300	8	9	2	2
Lake							
Polson	Polson	5,125	6,150	14	17	4	4
Ronan	Ronan	2,900	3,480	8	10	2	2
St. Ignatius	St. Ignatius	1,675	2,010	5	6	2	2
Lewis & Clark							
Augusta	Augusta	200	240	1	1	2	2
Benchmark (USFS)	Augusta (30 mi.)	200	24-	1	1	2	2
Helena Regional	Helena	33,000	44,900	90	123	23	31
Lincoln	Lincoln	2,000	2,400	5	7	2	2
Oxbow Ranch	Wolf Creek	150	180	0	0	2	2
Liberty							
Liberty County	Chester	5,250	6,300	14	17	4	4
Tiber Dam		200	240	1	1	2	2

TABLE IV.2

GENERAL AVIATION PEAK HOUR OPERATIONS

Airports by County	City or Town	Annual Operations		Average Day		Peak Hour Operations	
		1987	2005	1987	2005	1987	2005
Lincoln							
Eureka	Eureka	2,750	3,300	8	9	2	2
Libby	Libby	4,125	4,950	11	14	3	3
Troy (USFS)	Troy	500	600	1	2	2	2
Madison							
Big Sky Airpark	Ennis	3,575	5,500	10	15	2	4
Twin Bridges	Twin Bridges	1,875	2,250	5	6	2	2
McCone							
Circle Town-Country	Circle	3,300	3,960	9	11	2	3
Meagher							
White Sulphur Springs	White Sulphur Springs	2,025	2,430	6	7	2	2
Mineral							
Mineral County	Superior	3,275	3,930	9	11	2	3
Missoula							
Condon (USFS)	Condon	250	300	1	1	2	2
Rock Creek-Elliot	Clinton	250	300	1	1	2	2
Johnson-Bell Field	Missoula	53,500	73,300	147	201	37	50
Seeley Lake	Seeley Lake	1,350	1,620	4	4	2	2
Musselshell							
Roundup	Roundup	3.55-	4.260	10	12	2	3
Park							
Gardiner	Gardiner	3,075	3,690	8	10	2	3
Mission Field	Livingston	5,125	6,150	14	17	4	4
Wilsall	Wilsall	275	330	1	1	2	2
Phillips							
Malta	Malta	6,650	7,980	18	22	5	5
Morgan (Border)	Morgan	200	240	1	1	2	2
Pondera							
Conrad	Conrad	4,175	5,010	11	14	3	3
Valier	Valier	5,492	6,590	15	18	4	5
Powder River							
Belle Creek	Belle Creek	700	840	2	2	2	2
Broadus	Broadus	1,875	2,250	5	6	2	2
Powell							
Deer Lodge	Deer Lodge	2,925	3,510	8	10	2	2
Prairie							
Terry	Terry	1,850	2,220	5	6	2	2
Ravalli							
Hamilton	Hamilton	10,550	12,660	29	35	7	9
Stevensville	Stevensville	4,950	5,940	15	16	3	4

TABLE IV.2

GENERAL AVIATION PEAK HOUR OPERATIONS

Airports by County	City or Town	Annual Operations 1987	Annual Operations 2005	Average Day 1987	Average Day 2005	Peak Hour Operations 1987	Peak Hour Operations 2005
Richland							
Fairview	Fairview	600	720	2	2	2	2
Sidney-Richland Mun.	Sidney	18,000	22,300	49	61	12	15
Roosevelt							
Big Sky Field	Culbertson	3,850	4,620	11	13	3	3
Poplar	Poplar	2,875	3,450	8	9	2	2
Wolf Point Int'l.	Wolf Point	10,250	13,000	28	36	7	9
Rosebud							
St. Labre Mission	Ashland	450	540	1	1	2	2
Tillitt Field	Forsyth	5,625	6,750	15	18	4	5
Sanders							
Hot Springs	Hot Springs	400	480	1	1	2	2
Plains	Plains	2,025	2,430	6	7	2	2
Thompson Falls	Thompson Falls	1,525	1,830	4	5	2	2
Sheridan							
Sher-Wood	Plentywood	6,600	7,920	18	22	5	5
Silver Bow							
Bert Mooney	Butte	13,200	17,000	36	47	9	12
Stillwater							
Columbus	Columbus	4,800	5,760	13	16	3	4
Sweet Grass							
Big Timber	Big Timber	3,425	4,110	9	11	2	3
Teton							
Choteau	Choteau	2,800	3,360	8	9	2	2
Dutton	Dutton	3,125	3,750	9	10	2	3
Fairfield	Fairfield	2,750	3,300	8	9	2	2
Toole							
Ross Int'l.	Sweetgrass	200	240	1	1	2	2
Shelby	Shelby	5,975	7,170	16	20	4	5
Sunburst	Sunburst	200	240	1	1	2	2
Treasure							
Hysham	Hysham	400	480	1	1	2	2
Valley							
Glasgow Int'l.	Glasgow	22,000	26,200	60	72	15	18
Hinsdale	Hinsdale	600	720	2	2	2	2
Opheim	Opheim	300	360	1	1	2	2
Valley Ind. Park	Glasgow	1,000	1,200	3	3	2	2
Wheatland							
Harlowton	Harlowton	2,400	2,880	7	8	2	2
Yellowstone							
Billings-Logan Int'l.	Billings	78,350	151,000	215	415	54	103
Laurel Municipal	Laurel	18,000	21,600	49	59	12	15

Chapter V

Individual Airport Requirements

CHAPTER V: INDIVIDUAL AIRPORT REQUIREMENTS

One of the most important aspects of a system plan is the development of the improvements necessary at each system airport. The recommended improvements contained in this chapter were based on information collected during the airport inventory phase of the study, the current and forecast operations, and data contained on the FAA's 5010 inventory forms.

It is necessary to first identify the facilities that are considered desirable for Montana's various sized airports. The facilities at NPIAS airports should reflect their greater importance to the system than those at non-NPIAS airports. The following standards were used as a general guideline to evaluate the basic needs at each airport and to develop a list of recommended improvements:

NPIAS Airports - The following minimum facilities were considered desirable:

- A minimum of one paved runway meeting basic utility length and width. (A general utility length runway is desirable at airports with substantial twin or jet operations.)
- Adequate runway safety areas.
- A paved connecting taxiway and apron area.
- Airspace should meet all Part 77 requirements where possible.
- Medium-intensity runway lighting, lighted wind cone and beacon.
- A glide slope system on runways with approaches over towns or other significant obstacles.
- Perimeter fencing.

Non-NPIAS Airports - The following minimum facilities were considered desirable:

- One runway (turf or paved) maintained in operational condition meeting basic utility length and width.
- 20:1 approach surfaces to all runways. It is, of course, desirable for the airspace to meet all Part 77 requirements, where possible.
- Perimeter fencing.

Obviously, each airport is unique with respect to the general layout, airspace and surrounding land use. Therefore, airports were evaluated individually and recommended improvements were based on conditions found at each site.

The largest of Montana's airports were handled somewhat differently than the other system airports. The recommendations for the scheduled air-service airports were developed from current Master Plans, Airport Layout Plans, and, in some cases, discussions with the airport managers.

Special attention was given to all airports currently operated and maintained by the Montana Aeronautics Division. Many of these airports have very low activity. It is recommended the State transfer the ownership of these airports to the local community or pilots that receive the greatest benefit from the facility. If the county or local pilots are not willing to accept the responsibility of ownership, then the State should evaluate the costs and benefits of operating and maintaining the facility to determine if the airport should remain open to the public. In either case, the financial burden of operating state-owned airports should be minimized.

The recommendations included in this chapter do not reflect the periodic maintenance that is necessary at most airports. Only major improvement projects have been identified. It is strongly recommended that necessary interim maintenance, such as sealing pavement cracks, applying runway paint, weed control, and maintaining the lighting systems be performed regularly. A well-maintained facility will provide a high level of service and safety to the users at a lower overall cost.

An estimate of the improvement cost and the year when the improvement project will be required has been provided in this chapter. Estimates are based on 1988 construction costs (in 1988 dollars) and include engineering and administrative fees (20%). All improvements identified for 1989 were considered as immediate improvements and should be implemented when funds are available. Future year projects at a specific airport were based on the date of its last major improvement project. It was assumed that if an immediate pavement oriented project could not be performed in the year scheduled, future year pavement projects would be postponed accordingly.

The individual airport requirements were developed by the Consultant and do not necessarily reflect the views or policies of the Montana Aeronautics Division or the FAA.

The recommended improvements and costs are shown for each system airport in Appendix C of this report. The total cost of the individual airport requirements is approximately $206 million.

Graphic plots from the Montana Aeronautics Division's Airport Directory have been included for each airport to provide a visual reference for the reader. The airports are presented in alphabetical order by associated city and are listed in the index below for reference purposes:

TABLE V.I

INDIVIDUAL AIRPORT REQUIREMENTS

AIRPORT INDEX

Airport City	Name	County	Recommended 20-Year Project Costs	Page
Anaconda		Deer Lodge	$ 1,260,000	C-4
Ashland	St. Labre Mission	Rosebud	20,000	C-5
Augusta		Lewis and Clark	10,000	C-6
Babb		Glacier	2,000	C-7
Baker		Fallon	2,237,000	C-8
Belle Creek		Powder River	200,000	C-10
Benchmark	USFS	Lewis and Clark	630,000	C-11
Big Fork	Ferndale	Flathead	891,000	C-12
Big Sandy		Chouteau	547,000	C-13
Big Timber		Sweetgrass	398,000	C-14
Billings	Logan Int'l.	Yellowstone	80,768,000	C-15
Boulder		Jefferson	0	C-18
Bozeman	Gallatin Field	Gallatin	10,200,000	C-19
Bridger	Bridger Municipal	Carbon	205,000	C-21
Broadus		Powder River	860,000	C-22
Browning	Starr-Browning	Glacier	320,000	C-23
Butte	Bert Mooney	Silver Bow	7,672,000	C-24
Canyon Ferry		Broadwater	0	C-26
Chester	Liberty County	Liberty	552,000	C-27
Chinook		Blaine	1,560,000	C-28
Choteau		Teton	769,000	C-29
Circle	Circle Town-County	McCone	354,000	C-30
Clinton	Rock Creek-Elliot Field	Missoula	3,000	C-31
Colstrip		Rosebud	2,130,000	C-32
Columbus		Stillwater	905,000	C-33
Condon	USFS	Missoula	3,000	C-34
Conrad		Pondera	818,000	C-35
Culbertson	Big Sky Field	Roosevelt	658,000	C-36
Cut Bank	Cut Bank Municipal	Glacier	1,529,000	C-37
Deer Lodge	Deer Lodge City-County	Powell	390,000	C-38
Del-Bonita	Whetstone Int'l. (Border Crossing)	Glacier	0	C-39
Dell		Beaverhead	409,000	C-40
Denton		Fergus	0	C-41
Dillon	Beaverhead County	Beaverhead	1,635,000	C-42
Drummond		Granite	924,000	C-43
Dutton		Teton	27,000	C-44
East Poplar	(Border Crossing)	Daniels	0	C-45
Ekalaka		Carter	862,000	C-46
Ennis	Big Sky Airpark	Madison	1,342,000	C-47
Eureka		Lincoln	958,000	C-48

TABLE V.I (CONT.)

INDIVIDUAL AIRPORT REQUIREMENTS

AIRPORT INDEX

Airport City	Name	County	Recommended 20-Year Project Costs	Page
Fairfield		Teton	$ 0	C-49
Fairview		Richland	0	C-50
Forsyth	Tillitt Field	Rosebud	572,000	C-51
Fort Benton		Chouteau	1,325,000	C-52
Fort Smith	Yellowtail Dam	Big Horn	222,000	C-53
Gardiner		Park	873,000	C-54
Geraldine		Chouteau	275,000	C-55
Glasgow	Glasgow Int'l.	Valley	1,615,000	C-56
Glasgow	Valley Ind. Park	Valley	0	C-57
Glendive	Dawson Community	Dawson	1,565,000	C-58
Great Falls	Great Falls Int'l.	Cascade	8,061,000	C-59
Hamilton	Ravalli County	Ravalli	1,717,000	C-62
Hardin	Fairgrounds Airpark	Big Horn	201,000	C-63
Harlem	Riggin Memorial	Blaine	305,000	C-64
Harlowton		Wheatland	581,000	C-65
Havre	Havre City-County	Hill	1,280,000	C-66
Helena	Helena Regional	Lewis and Clark	5,588,000	C-67
Hinsdale		Valley	0	C-69
Hogeland		Blaine	16,000	C-70
Hot Springs		Sanders	0	C-71
Hysham		Treasure	2,000	C-72
Jordan		Garfield	385,000	C-73
Kalispell	City Field	Flathead	877,000	C-74
Kalispell	Glacier Park Int'l.	Flathead	13,840,000	C-75
Laurel	Laurel Municipal	Yellowstone	1,197,000	C-77
Lavina		Golden	0	C-78
Lewistown		Fergus	2,648,000	C-79
Libby		Lincoln	654,000	C-80
Lincoln		Lewis and Clark	344,000	C-81
Livingston	Mission Field	Park	546,000	C-82
Malta		Phillips	395,000	C-83
Meadow Creek	USFS	Flathead	5,000	C-84
Miles City	Frank Wiley Field	Custer	1,386,000	C-85
Missoula	Johnson-Bell Field	Missoula	22,900,000	C-86
Morgan	(Border Crossing)	Phillips	0	C-88
Opheim	(Border Crossing)	Valley	0	C-89
Philipsburg	Riddick Field	Granite	485,000	C-90
Plains		Sanders	835,000	C-91
Plentywood	Sher-Wood	Sheridan	715,000	C-92
Polson		Lake	510,000	C-93

TABLE V.I (CONT.)

INDIVIDUAL AIRPORT REQUIREMENTS

AIRPORT INDEX

Airport City	Name	County	Recommended 20-Year Project Costs	Page
Poplar		Roosevelt	$ 308,000	C-94
Red Lodge		Carbon	402,000	C-95
Richey		Dawson	0	C-96
Ronan		Lake	440,000	C-97
Roundup		Musselshell	470,000	C-98
Ryegate		Golden Valley	0	C-99
St. Ignatius		Lake	167,000	C-100
Schafer	Schafer Meadows (USFS)	Flathead	5,000	C-101
Scobey		Daniels	370,000	C-102
Seeley Lake		Missoula	2,000	C-103
Shelby		Toole	1,180,000	C-104
Sidney	Sidney-Richland Municipal	Richland	1,782,000	C-105
Spotted Bear	USFS	Flathead	5,000	C-107
Stanford		Judith Basin	500,000	C-108
Stevensville		Ravalli	390,000	C-109
Sunburst		Toole	0	C-110
Superior	Mineral County	Mineral	306,000	C-111
Sweetgrass	Ross Int'l. (Border Crossing)	Toole	0	C-112
Terry	Patterson Field	Prairie	420,000	C-113
Thompson Falls		Sanders	425,000	C-114
Three Forks	Pogreba Field	Gallatin	326,000	C-115
Tiber Dam	Tiber Dam	Liberty	0	C-116
Townsend		Broadwater	910,000	C-117
Troy	USFS	Lincoln	174,000	C-118
Turner		Blaine	410,000	C-119
Twin Bridges		Madison	1,174,000	C-120
Valier		Pondera	0	C-122
West Yellowstone	Yellowstone	Gallatin	1,006,000	C-123
Whitefish		Flathead	2,000	C-124
White Sulphur Springs		Meagher	520,000	C-125
Wilsall		Park	0	C-126
Winifred		Fergus	0	C-127
Wisdom		Beaverhead	0	C-128
Wolf Creek	Oxbow Ranch	Lewis and Clark	0	C-129
Wolf Point	Wolf Point Int'l.	Roosevelt	744,000	C-130
Total 20-Year Project Cost			$206,406,000	

Chapter VI

Aviation System Requirements

CHAPTER VI: AVIATION SYSTEM REQUIREMENTS

The purpose of this chapter is to examine the aviation system requirements in Montana as opposed to individual airport requirements. The system components examined include: commercial air service, essential air service, air-taxi operations, agricultural spray operations, navaids, AWOS, surface transportation, and future system alternatives.

A. COMMERCIAL AIR SERVICE[1]

In 1978 Congress passed the Airline Deregulation Act which virtually ended government control of the airlines. Deregulation was supposed to spur competition, improve service, and reduce prices. Unfortunately, the result for many of the country's less populated states, including Montana, was a deterioration in service, instability within the airline industry, and significant fare increases. Some major airlines have reduced or eliminated service to many of Montana's cities in favor of more lucrative markets in other states. One dramatic change in commercial air service is the replacement of the large jet aircraft with commuter-type turboprop planes.

Since deregulation, Montana has experienced dramatic changes in commercial airline service. The changes in the service provided by each airline are shown below:

- Northwest decided in 1986 to replace its full-body jet service from Great Falls to Billings and Spokane with Big Sky commuter flights. Then, after Northwest bought Republic Airlines, it decided to drop westbound services from Bozeman, Great Falls, and Missoula. The airline pulled out of Helena completely in 1987 and dropped service to Butte in 1984.

- Big Sky (Northwest Airlink) now feeds former Northwest passengers either into Billings or Spokane, the two regional Northwest "hubs", using 15 passenger turboprops. Big Sky has added 5 new planes in order to accommodate an increased service load of 70% since Northwest ended its westbound service. A typical westbound shuttle from Billings to Spokane has 4 planes taking off within 60-90 minutes of each other and servicing one of the cities abandoned by Frontier, plus Bozeman along the way. The Airlink currently serves Billings, Bozeman, Butte, Great Falls, Glasgow, Glendive, Havre, Helena, Kalispell, Miles City, Missoula, Sidney, and Wolf Point.

- Frontier served Billings, Bozeman, Glasgow, Glendive, Great Falls, Havre, Kalispell, Lewistown, Miles City, Missoula, Sidney, West Yellowstone, and Wolf Point in 1978. After Congress deregulated the airlines, Frontier dropped its commuter prop jet service to Glasgow, Glendive, Havre, Lewistown, Miles City, Sidney, and Wolf Point. Big Sky replaced this service with a mix of commuter prop jet and piston engine aircraft. Frontier's jet service pulled out of West Yellowstone in 1984 and was replaced by commuter service from SkyWest. Frontier's bankruptcy in the fall of 1986 caused flight cancellations in Billings, Great Falls, Bozeman, Kalispell, and Missoula.

- Western Airlines dropped service to West Yellowstone in 1979 and added flights to Bozeman and Kalispell in 1982. Delta merged with Western last April and picked up all points served by Western.

- Delta Airlines entered the Montana market place by merging with Western Airlines in 1987. Delta currently serves Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, and Missoula.

- Continental Airlines began serving Montana in August 1982 and stopped in 1983. Continental returned to Billings and Great Falls in 1986 after three years' absence with two daily round-trip flights to Denver. After the Frontier bankruptcy, Continental picked up some of Frontier's former stops in Bozeman and Missoula.

- Skywest Airlines began daily air service using pressurized 30-passenger turboprop aircraft in March of 1988 from Salt Lake City to Bozeman, Butte, Billings, Great Falls, Helena, and Missoula. Skywest also provides seasonal service to Kalispell and West Yellowstone. Skywest now has intra-state non-stop service between several Montana cities and has added westbound flights to Spokane.

- Horizon (owned by Alaska Air) scheduled two daily flights from Helena to Spokane in 1986 after Northwest's departure. Horizon now has four daily flights to Spokane servicing Billings, Great Falls, Helena, Kalispell, and Missoula.

- Cascade went out of business in 1986 and dropped its flights between Spokane, Butte, Helena, and Kalispell.

- Pioneer dropped its flights from Billings to Denver shortly before it went out of business after losing its marketing alliance with Continental.

- United Airlines began service in Montana after deregulation by serving Billings and Great Falls. More recently, United Express Regional Airline added flights to Missoula and Kalispell.

A certain amount of change in the airline industry is to be expected in a deregulated system. Currently Montana is experiencing different levels of service at the various primary airports. Most of them are receiving adequate service considering the size of the local market. In some areas, additional flights would be desirable while the Billings Airport, which acts as a mini-hub, appears to have more flights than the market can handle. Ultimately, supply and demand will control the level of commercial air service available in Montana.

The availability and affordability of stable, high-quality air service is an essential ingredient to the economic vitality of Montana. It is a crucial factor in the state's ability to enhance its economy. Stable air service provides growth potential for existing businesses and industries and provides an important incentive for attracting new businesses and industries. In today's business environment, firms located in Montana must compete on an international basis. Businesses which are forced to endure unstable, air service and high fares are automatically placed at a distinct disadvantage in their ability to compete. When Montana competes with other states to attract new business investment, the quality of air service is a critical factor which is considered by almost all site selectors for use in their evaluation.

B. ESSENTIAL AIR SERVICE (EAS) PROGRAM

The EAS Program was established by Congress as a result of deregulation of the commercial airline industry in 1978. The federal Department of Transportation (DOT) makes payments to air carriers for providing commercial service to communities determined eligible for EAS service. Generally, carriers would not provide scheduled air service to certain EAS communities unless they are subsidized because these communities do not generate a sufficient number of passengers at fares that cover carrier costs.

The EAS Program has been approved by Congress for a 10-year term lasting until 1997. Unfortunately, the federal Office of Management and Budget did not appropriate enough program funds to continue subsidies at the 1988 level. The DOT is in the process of adjusting the program to meet the lower appropriation limits. Changes to the EAS Program may have a significant impact in air service to Montana's 8 EAS communities (Glasgow, Glendive, Havre, Lewistown, Miles City, Sidney, West Yellowstone, and Wolf Point). Without the subsidies, commercial air service to these communities will most likely be reduced or discontinued entirely. The DOT will establish the revised EAS Program early in 1989.

C. AIR-TAXI OPERATIONS

Chartered-flight service is the only means of commercial air travel available to most of Montana's GA airports. In many cases, the air-taxi industry also provides emergency medical flight service to Montana's rural communities. The air-taxi operator is often required to fly into Montana's small airports during the middle of the night or in marginal weather conditions. As a result, the greatest need of the air-taxi industry is a system of adequate airport facilities.

In order for a community to be effectively served by the air-taxi industry, the local airport should have a paved, lighted runway sized to safely accommodate a twin turboprop aircraft, which is the typical aircraft used by the industry. In smaller communities where limited operations do not justify a large airport, air-taxi service may be limited to only single-engine aircraft service. The quality and size of the local airport determines the level of service that can be provided a community by the air-taxi industry.

D. AGRICULTURAL SPRAY OPERATIONS

Agricultural spray businesses in Montana constitute a viable industry. The aerial applicators provide a vital service to our state's agricultural areas. Spray planes have been used for years in Montana to apply agricultural chemicals. Traditionally the aerial applicators have used their aircraft hangar area to store and mix the chemi-

cals used in their business. In recent years the problems resulting from years of improper chemical use have caused soil and water contamination at some local airports. According to Bill Potts[2] of the State's Department of Health and Environmental Sciences, the Solid and Hazardous Waste Division has investigated approximately 12 cases in the past 3 years concerning chemical contamination at airports in Montana. In many instances, the problem has existed for years but was identified only recently due to heightened awareness of the general public.

Many airports have inherited chemical contamination problems from aerial applicators that operated on the airport in past years. Some airports have followed the lead of Gallatin Field which now requires a use agreement with the local applicators. The use agreement may contain specific requirements concerning the storage, use, and disposal of chemicals and typically require the operator to provide insurance or a bond to protect the airport from expensive clean-up costs. It is recommended that all airports require similar use agreements with the aerial applicators that intend to use the airport.

Currently, aerial applicators are regulated by the Montana Department of Agriculture and the Montana Department of Health and Environmental Sciences. The operations of the aerial applicator are now inspected at least once a year by the State's Agricultural Department.

Although the industry is regulated by the State, airport owners should be aware of the methods of chemical storage and disposal used on the airport site in an effort to prevent a clean-up operation that could cost the airport tens of thousands of dollars.

E. NAVAIDS

The VOR, VORTAC, and VOR/DME system of navigational aids provide electronic directional guidance to enroute aircraft in most portions of the state. The VOR system of navigation provides essential information to high level aircraft. Unfortunately, reception of the VOR signal is line-of-sight. Therefore, in many mountain valleys and at low-flight elevations in the state VOR navigation is unavailable. The addition of VOR transmitters in the Jordan and Broadus areas would be beneficial to cross-country pilots.

The airway beacon system was recently reviewed by the State Aeronautics Division. A questionnaire was sent to the state's registered pilots requesting their opinion of the usefulness and effectiveness of the airway beacons. The results of the survey indicated that the large majority of Montana pilots responding consider the beacons to be a necessary and effective element in the state's navigational system. The airway beacon program should continue to provide aircraft with visual guidance through Montana's mountainous region.

The use of non-directional radio beacons at Montana's airports has provided pilots with many years of inexpensive navigational assistance. The NDB's provide limited navigational information and primarily aid pilots in locating the airport site. In some cases, the NDB is also used when making an instrument approach. A distinct advantage of the NDB is that the signal is not line-of-sight and can be received at low-flight levels. The NDB system should be maintained and continue to operate as in the past.

The new Loran C navigational system is a promising system of navigation for the future of aviation. Most of Montana is already served by existing Loran stations located in the western United States. Some areas of Montana are located in what is referred to as the mid-continent gap where Loran reception is unreliable or unavailable. Plans by the FAA to install four additional Loran stations in the mid-United States between Texas and Montana will eliminate the gap and provide Loran reception in all parts of Montana. One of the new Loran stations is scheduled to be installed and operational in the Chester area in northcentral Montana by 1990.

The Loran system provides a variety of reliable information for enroute navigation. In the future, the Loran will most likely be used for non-precision instrument runway approach procedures.

Navigation may be provided by space satellites in the future. The military currently uses a global position system which utilizes satellite navigation. A civilian version of the global position system will most likely become the navigation system of the next century.

Radar service is provided throughout the state by the Air Route Traffic Control Centers (ARTCC) in Salt Lake City, Denver, and Seattle. Radar coverage in Montana is effective for aircraft at high altitudes. At lower altitudes and in the mountain areas radar coverage is inconsistent if available at all. This, of course, is typical of the limitations of air route radar coverage. There are two terminal radar systems in Montana, located at Great Falls and Billings. Currently, there is a need for additional terminal radar systems. Missoula, for instance, is already scheduled for terminal radar. Terminal radar service is also desirable at Helena Regional and Gallatin Field.

Instrument landing system (ILS) facilities at our major airports provide the capability to perform precision instrument landings. There is a need for a higher degree of instrument service at many of our state's airports. ILS equipment installations are eligible through the federal AIP program, but the local airport must provide the maintenance costs, which in many cases is prohibitive.

The microwave landing system (MLS) is the newest instrument system being used at a few airports around the country. The MLS technology is still being tested and refined. Expensive on-board MLS navigational equipment has contributed to slow acceptance of the new system by the airline industry.

F. CONSOLIDATION OF FLIGHT SERVICE STATIONS

A nationwide program has been underway for several years whereby the small local flight service stations (FSS) are being consolidated into larger automated service centers. The program will create 61 automated service stations nationwide with 46 stations in operation at this time.[3] The consolidation of Montana's 9 flight service stations will begin in 1990 when the Great Falls station is enlarged and equipped with a very sophisticated weather computer system. After the new Great Falls system is tested and approved, the Billings and Missoula flight service stations will be closed with their operations taken over by the Great Falls facility. During 1991, the other 6 flight service stations are scheduled to be closed as their operations are consolidated with the new system.

The weather observations at Montana's 9 flight service stations are currently taken manually by FSS employees. At the time of the initial consolidation, the local FSS offices will be closed but the weather observations will continue to be taken manually by a contracted weather observer. These contracted observers will eventually be replaced with a completely automatic observation system which will collect the weather data and transmit the information to the central weather computer in Great Falls for interpretation and distribution to the public.

The federal consolidation of manned flight service stations into one central facility has occurred in many other states. The new consolidated systems in these states do not necessarily provide service equal to the flight service provided in the past.

The consolidation of Nebraska's flight service stations occurred in 1987. According to Bob Lammers[4] of the Nebraska Aeronautics Division, the new consolidated system does provide equal or better service in most respects.

The most notable change has been the loss of the personalized service provided in the past. The FSS weather data is accurate and essentially unchanged from the old system. Initially, some Nebraska pilots reported system access problems causing delays of 5 to 10 minutes. It now appears that after one year of service both the FSS and the local pilots are getting used to the system and are learning to use it correctly. It is interesting to note that Nebraska supplements its 8 FSS weather observation stations with 17 State-operated stations. The Nebraska Aeronautics Division did not feel that the 8 FSS observation points in their state would provide enough weather information for the various airport locations statewide.

In Minnesota, Bob Peterson[5] of the Minnesota Aeronautics indicated similar results in his state. Minnesota has addressed the system access problems, which were significant after the consolidation, by installing computer terminals in 80 of the state's airports for pilot use. The remote computer terminals are linked by modem

to the central FSS weather computer. Local pilots now have instant access to the system and can also open and close their flight plans on the computer. The State of Minnesota also supplements the FSS weather observation points with state-contracted weather observation stations.

If everything goes as planned, the federal government will consolidate the flight service stations in Montana. As the system change occurs, FSS personnel and Montana's pilots will experience problems until everyone learns how to use the new system. The system access problems experienced in other states should be minimized by Montana's small population.

G. AUTOMATED WEATHER OBSERVATION SYSTEM (AWOS)

Automated weather observation devices, which currently cost approximately $50,000 each, have been in existence for many years. The automated systems being used to replace the local FSS observer can record all weather data such as wind speed and direction, barometric pressure, temperature, and dew point. The AWOS equipment can also measure precipitation, visibility, and cloud cover. However, there are limitations of the system when measuring visibility and cloud cover. Using a laser beam, the AWOS equipment continuously scans the sky above the observation point and records the cloud ceiling levels and estimates the percent of cloud cover. The automated system cannot detect what is occurring, for instance, 5 miles to the southeast. The instrument only records what is overhead at the time of the observation. Another drawback of the equipment is the lack of information concerning thunderstorm activity. Although some new AWOS systems do include lightning sensors, the automated equipment cannot forecast the arrival of a thunderstorm front that is fast approaching the observation site.

There are several interesting aspects of the AWOS system that could greatly improve the safety of aviation in Montana. The technology exists to connect the AWOS recorder to a vocal data transmitter linked to a Unicom, NDB, or VOR frequency. With this equipment setup, a pilot can contact the local Unicom and receive the current weather conditions automatically. It would be very desirable to have such a system located at every airport that has an instrument approach.

H. COMMUNICATIONS

Most aircraft in Montana are equipped with radio transmitters and receivers. Pilots use these radios to communicate with other aircraft and ground-based stations. Radio communication is used by control towers and radar service centers to provide air traffic control. These stations operate 15 to 18 hours a day on published time schedules. Radio contact with these stations varies depending on the surrounding terrain. Reception is adequate with the area controlled by the tower or radar facility.

The flight service stations use radio communication to provide pilot assistance, weather information, flight planning, and other pilot services. Aircraft can contact flight service from most locations throughout Montana. Unfortunately, at lower flight altitudes reception is often sporadic or unavailable, especially in mountain valleys of western Montana.

Communications at the local GA airports is usually provided by the unicom station based at the airport. The unicom operator can provide local air traffic information, current wind speed and direction, the barometric pressure, and other pilot information. The level of service provided by unicom stations in Montana varies considerably from airport to airport depending on the operator. The unicom is typically operated by the fixed-base operator, who monitors the unicom frequency only during his business hours. The better unicom operators monitor the air waves during daylight and early evening hours. There are no required minimum operating standards for local unicom stations. Approximately, 70 unicom stations are operated in Montana.

I. SURFACE TRANSPORTATION SYSTEM

The available methods of transportation between the airport and town are of great concern to the flying public. The aviator's journey between the airport and town is often the most difficult portion of the trip. Pilots often choose their stop-over airports based on the availability of local ground transportation. Airports with dependable ground transportation services tend to attract aviation business. Most of Montana's rural airports provide no local transportation services.

Each airport community should examine the possible ways that ground transportation to and from the airport can be provided. With contributions from the Chamber of Commerce, local service clubs, major businesses, restaurants, and hotels, a community could pool their resources to subsidize a shuttle system between the airport and town. A reliable local citizen using their personal vehicle or a community vehicle could provide the service on an on-call basis for hire with the community providing subsidized reimbursement funds for the individual's time and expenses.

Another important aspect of ground transportation is the availability of a public telephone on the airport site. The airport telephone allows the flying public to arrange for ground transportation into town. Without a phone, the pilot is often stranded. All public airports that serve nearby towns would benefit from an airport telephone and should consider providing one.

Some airports do not have telephone service because of vandalism problems. The pilot's lounge at the Harlem Airport was designed with a radio-activated door lock to protect against trespassers. Pilots can access the lounge and telephone by keying the unicom frequency on the airplane radio which unlocks the door to the building.

J. FUTURE SYSTEM ALTERNATIVES

Montana's large geographic area and widely scattered communities produce specific aviation system needs. The current system consists of 99 small local airports which provide access to Montana's rural communities and 15 moderate-sized airports with varying amounts of commercial service to other Montana cities and the surrounding states.

Expansion of the system airports is not required due to the slow rate of growth forecast for Montana's aviation operations. Emphasis in the future will be on maintaining existing facilities.

There is a possibility that the regional airport development concept may become a viable alternative in the future due to the lack of adequate funding at the local airport level.

The feasible alternatives to the current aviation system are limited. Certain decisions will have to be made that will control how we utilize new technology in navigation and weather data collection. The extent of the utilization of available systems rather than a choice between systems constitutes the only aviation system alternative.

ENDNOTE REFERENCES - CHAPTER VI

1. Portions of the narrative contained in this section were taken from an Air Service Issue paper with the permission of the author, Tamara McCann, Office of Senator Max Baucus, April 1988.

2. Bill Potts, Montana Department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau. Personal communication. August 25, 1988.

3. Arvid Hess, Planning and Automation Specialist for Flight Service, FAA, Seattle Regional Office, Personal communication. August 23, 1988.

4. Bob Lammers, Nebraska Aeronautics Division, Kerney, Nebraska. Personal communication. August 26, 1988.

5. Bob Peterson, Minnesota Division of Aeronautics, St. Paul, Minnesota. Personal communication. August 26, 1988.

CHAPTER VII: FINANCIAL ANALYSIS

A. ECONOMIC BENEFITS OF AVIATION

Transportation plays an important role in any working economy by linking businesses, consumers, suppliers, manufacturers, and marketers together. The presence of aviation within a community is essential to the establishment of a strong, diverse economic base. Aviation facilities are an instrument to attract new industry, a source of local employment, a source of tax revenue, and a means to increase local business activity.

The total economic effect that an airport has upon the surrounding community may be determined through an examination of direct and indirect contributions to the local economy by providers and users of aviation services. These contributions, in turn, induce additional economic activity as expenditures occur in subsequent rounds of spending. The following narrative discusses airport proprietor and employee income, air traveler expenditures and induced income for each county with airports to determine the total economic effects of aviation in Montana.

Statewide and county-specific estimates of income and employment resulting from aviation were developed using an economic-based model. This model sums estimates of county-specific basic and non-basic income to produce county and statewide income estimates. Basic income is calculated by totaling three categories of personal income resulting from on-site airport employment and personal income resulting directly from local expenditures by air travelers. Income multipliers were used to estimate the derivative effects of aviation activity in Montana. It should be noted that income information contained in this analysis is presented in 1986 dollars.

The nature of this economic study was limited by budgetary constraints; therefore, the findings of this analysis are based as much as possible on existing sources of employment and income data for Montana. No estimates of the economic benefits of federally-funded airport improvement projects were developed. Additionally, this analysis does not address aviation's enhancement of Montana commerce.

1. Basic Income from Airport Operation

Basic income provides the impetus for operation of a local economy. Basic income is generated directly by providers of services at Montana airports. Information on revenues and local expenditures for public and private service activities at the state's airports is unavailable. Calculations of the direct income effects of airport operations were derived from estimates of airport employee and proprietor earnings.

Total employment information for Montana's airports was obtained through on-site interviews with airport managers and from data gathered by the U.S. Department of Commerce. Employment was segregated by the categories of local government employees (personnel paid by local government or airport authorities); non-local government employees providing air transportation services (fixed base operators, air-taxi operators, etc.); and non-local government employees providing other (non-air transportation) services. Estimates of income were developed for each category of on-site employment using the most recent published reports by the U.S. Bureau of Economic Analysis and the Montana Department of Labor and Industry on county wage and salary income, other labor income and proprietors' income.[1,2] This method does not use exact incomes for airport employees because of the limited scope of this study. It does, however, provide an indication of the relative differences in direct impacts at airports in Montana because it uses a consistent data source (BEA and Montana Department of Labor income statistics).

Based on the on-site employment and income information gathered for this study, aviation in Montana is estimated to directly employ 2,678 persons and generate a direct economic impact of more than $56,000,000 annually. Tables VII.1 and VII.2 show the direct effects of on-site airport employee earnings by county.

2. Basic Income from Air Traveler Expenditures

Basic income also accrues to a local economy as a result of expenditures by non-local business travelers, tourists, and other visitors. The methodology used to determine the economic effects of air traveler expenditures in Montana employed separate formulas for general aviation impacts and air carrier impacts. The following text describes each formula and how it was used to calculate the effects of itinerant general aviation and air carrier traffic.

a. General Aviation Visitor Expenditures

The methodology used to quantify the economic impacts of general aviation operations on Montana's local economy is based upon a formula developed and used by the Aircraft Owners and Pilots Association (AOPA). The number of general aviation "visitor" passengers are used as a means of determining the amount of local expenditures in communities with airports.

A complex formula was used to estimate the number of visitor passengers and their local expenditures. First, the number of itinerant aircraft operations at each airport was obtained from the State System Plan inventory (See Appendix B) and used to compute the number of transient arrivals. The AOPA formula assumes that one-third of the general aviation arrivals are "true transients" (aircraft that departed from airports at least 150 miles away). Further, AOPA assumes a general aviation aircraft occupancy rate of 3.2 passengers per "true transient" arrival. Based on the results

Chapter VII

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TABLE VII.1

ON-AIRPORT EMPLOYMENT*

County	No. of Airports	Local Government Employment	Other Air Transportation-Employment	Other Employment	Total On-Site Airport Employment
Beaverhead	3	1.5	1	1.0	3.5
Big Horn	2	1.0	0	1.0	2.0
Blaine	4	0.0	0	3.5	3.5
Broadwater	2	1.0	0	1.0	2.0
Carbon	2	1.0	0	1.5	2.5
Carter	1	0.0	0	3.5	3.5
Cascade	1	37.0	161	422.0	620.0
Chouteau	3	1.0	1	10.0	12.0
Custer	1	1.0	6	11.0	18.0
Daniels	2	1.0	0	1.5	2.5
Dawson	2	1.0	4	0.0	5.0
Deer Lodge	1	1.0	0	4.5	5.5
Fallon	1	0.5	0	4.0	4.5
Fergus	3	1.0	7	20.0	28.0
Flathead	7	12.0	67	8.0	87.0
Gallatin	3	9.5	75	75.5	160.0
Garfield	1	0.0	0	1.0	1.0
Glacier	4	3.0	0	14.0	17.0
Golden Valley	2	0.0	0	0.0	0.0
Granite	2	0.0	0	1.0	1.0
Hill	1	1.0	8	1.0	10.0
Jefferson	1	0.0	0	0.0	0.0
Judith Basin	1	1.0	0	0.0	1.0
Lake	3	0.0	1	2.5	3.5
Lewis & Clark	5	38.0	41	410.0	489.0
Liberty	2	0.0	0	10.0	10.0
Lincoln	3	0.5	0	0.0	0.5
Madison	2	1.0	0	3.0	4.0
McCone	1	0.0	0	0.5	0.5
Meagher	1	0.0	0	0.0	0.0
Mineral	1	0.0	0	0.0	0.0
Missoula	4	28.0	107	208.0	343.0
Musselshell	1	0.0	0	10.0	10.0
Park	3	0.5	0	8.0	8.5
Petroleum	0	0.0	0	0.0	0.0
Phillips	2	0.0	1	2.0	3.0
Pondera	2	0.0	0	3.0	3.0
Powder River	2	0.0	0	2.0	2.0
Powell	1	0.0	0	0.0	0.0
Prairie	1	0.0	0	0.0	0.0
Ravalli	2	1.0	8	0.0	9.0
Richland	2	2.0	8	6.0	16.0
Roosevelt	3	2.0	6	0.5	8.5
Rosebud	2	0.0	0	2.0	2.0
Sanders	3	0.0	0	0.0	0.0
Sheridan	1	0.0	0	1.5	1.5
Silver Bow	1	9.0	16	65.0	90.0
Stillwater	1	0.0	0	1.0	1.0
Sweet Grass	1	1.0	0	6.0	7.0
Teton	3	1.0	0	0.0	1.0
Toole	3	1.0	0	4.0	5.0
Treasure	1	0.0	0	0.0	0.0
Valley	4	1.0	8	11.0	20.0
Wheatland	1	0.0	0	0.0	0.0
Wibaux	0	0.0	0	0.0	0.0
Yellowstone	2	45.0	328	278.0	651.0
State Total:	114	205.5	854	1619.0	2678.5

* Figures represent the number of persons employed at Montana's airports. The 0.5 figures represent part-time employment positions.

TABLE VII.2

EMPLOYEE AND PROPRIETOR EARNINGS (ON-AIRPORT EMPLOYMENT)

County	Local Government Employee Income	Other Air Transportation Employee Income	Other Employee Income	Total On-site Employee Income
Beaverhead	$22,575.0	$22,686.0	$20,637.0	$65,898.0
Big Horn	16,175.0	0.0	20,637.0	36,812.0
Blaine	0.0	0.0	72,229.5	72,229.5
Broadwater	13,190.0	0.0	20,637.0	33,827.0
Carbon	14,173.0	0.0	30,955.5	45,128.5
Carter	0.0	0.0	72,229.5	72,229.5
Cascade	650,682.0	3,652,446.0	8,708,814.0	13,011,942.0
Chouteau	13,525.0	22,686.0	206,370.0	242,581.0
Custer	15,028.0	136,116.0	227,007.0	378,151.0
Daniels	13,098.0	0.0	30,955.5	44,053.5
Dawson	15,398.0	90,744.0	0.0	106,142.0
Deer Lodge	16,427.0	0.0	92,866.5	109,293.5
Fallon	7,823.5	0.0	82,548.0	90,371.5
Fergus	13,877.0	158,802.0	412,740.0	585,419.0
Flathead	206,064.0	1,519,962.0	165,096.0	1,891,122.0
Gallatin	152,608.0	1,701,450.0	1,558,093.5	3,412,151.5
Garfield	0.0	0.0	20,637.0	20,637.0
Glacier	50,457.0	0.0	288,918.0	339,375.0
Golden Valley	0.0	0.0	0.0	0.0
Granite	0.0	0.0	20,637.0	20,637.0
Hill	17,000.0	181,488.0	20,637.0	219,125.0
Jefferson	0.0	0.0	0.0	0.0
Judith Basin	13,827.0	0.0	0.0	13,827.0
Lake	0.0	22,686.0	51,592.5	74,278.4
Lewis & Clark	687,800.0	930,126.0	8,461,170.0	10,079,096.0
Liberty	0.0	0.0	206,370.0	206,370.0
Lincoln	8,068.0	0.0	0.0	8,068.0
Madison	12,325.0	0.0	61,911.0	74,236.0
McCone	0.0	0.0	10,318.5	10,318.5
Meagher	0.0	0.0	0.0	0.0
Mineral	0.0	0.0	0.0	0.0
Missoula	507,276.0	2,427,402.0	4,292,496.0	7,227,174.0
Musselshell	0.0	0.0	206,370.0	206,370.0
Park	8,195.5	0.0	165,096.0	173,291.5
Petroleum	0.0	0.0	0.0	0.0
Phillips	0.0	22,686.0	41,274.0	63,960.0
Pondera	0.0	0.0	61,911.0	61,911.0
Powder River	0.0	0.0	41,274.0	41,274.0
Powell	0.0	0.0	0.0	0.0
Prairie	0.0	0.0	0.0	0.0
Ravalli	15,480.0	181,488.0	0.0	196,968.0
Richland	33,578.0	181,488.0	123,822.0	338,888.0
Roosevelt	33,600.0	136,116.0	10,318.5	180,034.5
Rosebud	0.0	0.0	41,274.0	41,274.0
Sanders	0.0	0.0	0.0	0.0
Sheridan	0.0	0.0	30,955.5	30,955.5
Silver Bow	176,103.0	362,976.0	1,341,405.0	1,880,484.0
Stillwater	0.0	0.0	20,637.0	20,637.0
Sweet Grass	12,311.0	0.0	123,822.0	136,133.0
Teton	14,068.0	0.0	0.0	14,068.0
Toole	13,294.0	0.0	82,548.0	95,842.0
Treasure	0.0	0.0	0.0	0.0
Valley	16,623.0	181,488.0	227,007.0	425,118.0
Wheatland	0.0	0.0	0.0	0.0
Wibaux	0.0	0.0	0.0	0.0
Yellowstone	785,430.0	7,441,008.0	5,737,086.0	13,963,524.0
State Total:	$3,576,079.0	$19,373,844.0	$33,411,303.0	$56,361,226.0

of the ramp surveys, the occupancy rate was reduced to 1.91 (developed from ramp surveys) to present a more realistic estimate of general aviation passengers per transient arrival in Montana. The AOPA formula also estimates that the average daily expenditure of each visitor is $25.00. The final assumption used in the formula is that 60% of the passenger visits last an average of one day and 40% last an average of three days. Therefore, the "revised" AOPA formula is shown as follows:

Number of Transient Operations/2 = Transient Arrivals

Transient Arrivals x 33.3% = True Transient Arrivals

True Transient Arrivals x 1.91 = General Aviation Visitors

GA Visitors x $25 x 60% = Expenditures of 1-Day Visitors

GA Visitors x $25 x 3 x 40% = Expenditures of 3-Day Visitors

Expenditures of 1-Day Visitors + Expenditures of 3-Day Visitors = Indirect Economic Impact of GA Visitors

Based on the above formula, the total annual expenditures resulting from general aviation (one- and three-day) visitor spending in Montana is estimated to be $3,841,166 (see Table VII.3).

b. Air Carrier Passenger Expenditures

Several additional factors must be considered when calculating the economic impacts of air carrier passengers upon a community. Total deplanements at each of the 15 air carrier airports in Montana was used as the primary factor to determine the expenditures resulting from air carrier passenger activity. Since detailed information on deplanements for each air carrier airport was unavailable, it was assumed that the number of deplanements was equal to the number of enplanements at each airport.

The number of total deplanements at an airport was multiplied by the average stay of a visitor in Montana which was estimated at 2.5 days following conversations with the Montana Department of Commerce, Promotion Division and the Helena Chamber of Commerce. The product of this calculation (total deplanements times length of stay) was multiplied by an average expenditure per day of $47. The average daily expenditure was estimated from the AOPA study and conversations with personnel from the State Promotion Division and the Montana Airport Managers Association (MAMA). This procedure identified the total expenditures of passengers for each air carrier airport. The total annual expenditures of air carrier passenger activity in Montana is estimated to be $101,298,900.

TABLE VII.3

INDIRECT ECONOMIC IMPACTS OF AVIATION

County	Air Carrier Passenger Expenditures	General Aviation Visitor Expenditures	Total Air Traveler Expenditures	Percent Air Travel Only	Local Income Capture Rate	Adjusted Total Income from Air Traveler Expenditures
Beaverhead		$34,057	$34,057	0.5	0.25	$4,257.1
Big Horn		34,311	34,311	0.5	0.25	4,288.9
Blaine		86,414	86,414	0.5	0.25	10,801.7
Broadwater		23,033	23,033	0.5	0.25	2,879.1
Carbon		30,181	30,181	0.5	0.25	3,772.7
Carter		16,203	16,203	0.5	0.25	2,025.3
Cascade	$17,455,900	213,117	17,669,017	0.5	0.25	2,208,627.2
Chouteau		83,554	83,554	0.5	0.25	10,444.3
Custer	199,400	58,297	257,697	0.5	0.25	32,212.2
Daniels		26,369	26,369	0.5	0.25	3,296.1
Dawson	180,000	57,503	237,503	0.5	0.25	29,687.9
Deer Lodge		19,380	19,380	0.5	0.25	2,422.4
Fallon		40,824	40,824	0.5	0.25	5,103.0
Fergus	58,750	51,656	110,376	0.5	0.25	13,797.0
Flathead	6,487,200	475,275	6,962,475	0.5	0.25	870,309.3
Gallatin	12,689,200	231,283	12,920,483	0.5	0.25	1,615,060.4
Garfield		12,708	12,708	0.5	0.25	1,588.5
Glacier		53,691	53,691	0.5	0.25	6,711.3
Golden Valley		1,716	1,716	0.5	0.25	214.4
Granite		15,091	15,091	0.5	0.25	1,886.3
Hill	105,750	76,883	182,633	0.5	0.25	22,829.1
Jefferson		10,484	10,484	0.5	0.25	1,310.5
Judith Basin		17,473	17,473	0.5	0.25	2,184.2
Lake		61,633	61,633	0.5	0.25	7,704.2
Lewis & Clark	5,865,600	230,966	6,096,566	0.5	0.25	762,070.7
Liberty		34,629	34,629	0.5	0.25	4,328.6
Lincoln		46,860	46,860	0.5	0.25	5,857.5
Madison		34,629	34,629	0.5	0.25	4,328.6
McCone		20,968	20,968	0.5	0.25	2,621.0
Meagher		12,867	12,867	0.5	0.25	1,608.3
Mineral		20,809	20,809	0.5	0.25	2,601.1
Missoula	15,413,650	281,168	15,694,818	0.5	0.25	1,961,852.3
Musselshell		22,556	22,556	0.5	0.25	2,819.6
Park		56,074	56,074	0.5	0.25	7,009.2
Petroleum		0	0	0.5	0.25	0.0
Phillips		43,524	43,524	0.5	0.25	5,440.6
Pondera		44,319	44,319	0.5	0.25	5,539.8
Powder River		16,361	16,361	0.5	0.25	2,045.2
Powell		18,585	18,585	0.5	0.25	2,323.2
Prairie		11,755	11,755	0.5	0.25	1,469.3
Ravalli		98,486	98,486	0.5	0.25	12,310.8
Richland	900,300	87,526	987,826	0.5	0.25	123,478.2
Roosevelt	212,450	87,208	299,658	0.5	0.25	37,457.2
Rosebud		38,600	38,600	0.5	0.25	4,825.0
Sanders		25,098	25,098	0.5	0.25	3,137.3
Sheridan		41,936	41,936	0.5	0.25	5,242.0
Silver Bow	3,300,100	81,013	3,381,113	0.5	0.25	422,639.1
Stillwater		30,499	30,499	0.5	0.25	3,812.4
Sweet Grass		21,762	21,762	0.5	0.25	2,720.3
Teton		55,120	55,120	0.5	0.25	6,890.1
Toole		40,506	40,506	0.5	0.25	5,063.3
Treasure		2,542	2,542	0.5	0.25	317.7
Valley	300,200	71,958	372,158	0.5	0.25	46,519.8
Wheatland		15,249	15,249	0.5	0.25	1,906.2
Wibaux		0	0	0.5	0.25	0.0
Yellowstone	38,130,400	516,486	38,656,886	0.5	0.25	4,830,860.8
State Total	$101,298,900	$3,841,166	$105,140,066	–	–	$13,142,508.3

c. Total Income From Air Traveler Expenditures

Basic income resulting from the effects of traveler expenditures was predicted by adjusting the sum of the income estimates for air carrier and general aviation travelers by local value added and air traveler exclusivity factors. Local value added to traveler purchases was assumed to be 25% of total expenditures. This is the same rate that was used by the University of Montana's Bureau of Business and Economic Research in its 1984 study of the Montana travel history.[3] Additionally, it was assumed that half of the air travelers visiting Montana communities would have completed their travels irrespective of the availability of air service. Therefore, the initial estimates of gross income resulting from the expenditures of air travelers was reduced by 50% to account for the expenditures of travelers who would only travel to Montana by air.

Table VII.3 contains the income estimates by county generated by the expenditures of air carrier and general aviation travelers. As shown in the table, the total income from air traveler expenditures in Montana is estimated to be $13,142,508.

3. Total Basic Income

The total basic income resulting from aviation activity in Montana was derived by summing total airport proprietor and employee earnings and basic income resulting from air traveler expenditures. Table VII.4 presents the total basic income from aviation for each county and the state. As evidenced by the table, the total basic income resulting from aviation activity in Montana is estimated to be $69,373,734.

4. Induced Economic Impacts

Induced impacts are the "multiplier effects" or spin-offs of second and subsequent rounds of spending as basic income re-circulates through the community. According to the multiplier effect, every dollar expended in the local economy is respent by trade to generate additional dollars of income or revenue. As income is spent within the community for goods and services, it becomes income for someone else who, in turn, spends it and creates income for yet another. Each dollar earned will be spent several times before it leaves the community, creating a final impact on the local economy greater than the amount of the initial expenditure. Factors called income multipliers are used to determine this recirculation of money in the economy. For instance, a multiplier of 1.5 means that a $1.00 of income generated results in a total impact of $1.50 throughout the whole economy. The total impact includes $1.00 of direct impact plus another $.50 of indirect and induced impacts.

TABLE VII.4

INDUCED INCOME EFFECTS OF AVIATION IN MONTANA

County	Total On-Site Employee Income	Adjusted Local Income from Air Traveler Exenditures	Total Basic Income	Income Multiplier	Induced Income
Beaverhead	$ 65,898	$ 4,257	$ 70,155	0.23	$ 16,136
Big Horn	36,813	4,289	41,101	0.66	27,127
Blaine	7,230	10,802	18,031	0.23	4,147
Broadwater	33,827	2,879	36,706	0.23	8,442
Carbon	45,129	3,773	48,901	0.23	11,247
Carter	7,230	2,025	9,255	-/13	2,129
Cascade	13,011,942	2,208,627	15,220,569	1.02	15,524,981
Chouteau	242,581	10,444	253,025	0.23	58,196
Custer	378,151	32,212	410,363	0.66	270,840
Daniels	44,054	3,296	47,350	0.23	10,890
Dawson	106,142	29,688	135,830	0.66	89,648
Deer Lodge	109,294	2,422	111,716	0.66	73,733
Fallon	90,372	5,103	95,475	0.23	21,959
Fergus	585,419	13,797	599,216	0.66	395,483
Flathead	1,891,122	870,309	2,761,431	1.02	2,186,660
Gallatin	3,412,152	1,615,060	5,027,212	1.02	5,127,756
Garfield	20,637	1,588	22,225	0.23	5,112
Glacier	339,375	6,711	346,086	0.66	228,417
Golden Valley	0	214	214	0.23	49
Granite	20,637	1,886	22,523	0.23	5,180
Hill	219,125	22,829	241,954	0.66	159,690
Jefferson	0	1,311	1,311	0.23	301
Judith Basin	13,827	2,184	16,011	0.23	3,683
Lake	74,279	7,704	81,983	0.66	54,109
Lewis & Clark	10,079,096	762,071	10,841,167	1.02	11,057,990
Liberty	206,270	4,329	210,699	0.23	48,461
Lincoln	8,068	5,858	13,926	0.66	9,191
Madison	74,236	4,329	78,565	0.23	18,070
McCone	10,319	2,621	12,940	0.23	2,976
Meagher	0	1,608	1,608	0.23	370
Mineral	0	2,601	2,601	0.23	598
Missoula	7,227,174	1,961,852	9,189,026	1.02	9,372,807
Musselshell	206,370	2,820	209,190	0.23	48,114
Park	173,292	7,009	180,301	0.66	118,998
Petroleum	0	0	0	--	0
Phillips	63,960	5,441	69,401	0.23	15,962
Pondera	61,911	5,540	67,451	0.23	15,514
Powder River	41,274	2,045	43,319	0.23	9,963
Powell	0	2,323	2,323	0.23	534
Prairie	0	1,469	1,469	0.23	338
Ravalli	196,968	12,311	209,279	0.66	138,124
Richland	338,888	123,478	462,366	0.66	305,162
Roosevelt	180,035	37,457	217,492	0.66	143,545
Rosebud	41,274	4,825	46,099	0.66	30,425
Sanders	0	3,137	3,137	0.23	722
Sheridan	30,956	5,242	36,198	0.23	8,325
Silver Bow	1,880,484	422,639	2,303,123	1.02	2,349,186
Stillwater	20,637	3,812	24,449	0.23	5,623
Sweet Grass	136,133	2,720	138,853	0.23	31,936
Teton	14,068	6,890	20,958	0.23	4,820
Toole	95,842	5,063	100,905	0.23	23,208
Treasure	0	318	318	0.23	73
Valley	425,118	46,520	471,638	0.66	311,281
Wheatland	0	1,906	1,906	0.23	438
Wibaux	0	0	0	--	0
Yellowstone	13,963,524	4,830,861	18,794,385	1.02	19,170,272
State Total:	$56,231,226	$13,142,508	$69,373,734	--	$68,158,940

The AOPA has devised a formula to calculate induced impacts for aviation that uses an average income multiplier of four. However, since local economic trends and expenditures influence this number, income multipliers vary from area to area. For example a Fort Lauderdale, Florida study used a multiplier of 4.2; a New Jersey study used 3.0; a Massachusetts study used 2.8; and a Portland, Oregon study used a multiplier of 2.26.

Local economic trends in Montana dictate the use of a much lower income multiplier. Two recent economic studies of aviation impacts in Montana, the MAMA Study on Statewide Airport Impacts and the Billings-Logan International Airport area economic study, indicate that a multiplier of 1.6 may be more appropriate for the state. An income multiplier of 1.5 was developed by economists at Montana State University to quantify the induced impacts of air transportation expenditures in Montana.

A 1977 study of the economics of sparsely populated regions by James Chalmers et al. developed multipliers that varied by the size of each area.[4] The study suggested that dollars expended in small, rural counties have a less significant economic effect than those spent in larger, more urban ones. Differential income multipliers were then used for small, medium, and large counties in Montana to provide a more realistic assessment of the economic impacts of aviation. Based on the findings of the Chalmer's study, a multiplier of 1.23 was used for counties with populations under 9,000; 1.66 for counties with populations between 9,000 and 30,000; and 2.02 for counties with populations exceeding 30,000.

Table VII.5 contains a summary of the induced impacts of aviation in each Montana county. As shown, aviation is estimated to produce $68,158,940 of induced economic impacts each year.

Employment resulting from the direct effects of traveler expenditures was estimated by dividing estimates developed for the traveler expenditure income by county specific mean earnings (farm earnings were excluded). Other aviation-induced employment was estimated by applying county per capita income levels and county employment to population ratios to secondary income levels. Based on this procedure, it was estimated that the effects of air traveler expenditures and other local derivative income are responsible for 3,915 aviation-induced jobs in Montana.

5. Summary of Economic Impacts of Aviation

The total economic impact that an airport has on the county it is situated in has been discussed in the previous narrative. Table VII.5 contains a summary of the total direct, total indirect, and induced impacts of aviation activity for each Montana County and the state. As shown in the table, aviation accounts for approximately $137,532,675 of total economic impacts each year in Montana.

TABLE VII.5

SUMMARY OF ECONOMIC IMPACTS OF AVIATION IN MONTANA*

County	Onsite Airport Employ.	Total On-site & Derivative Employ.	Total On-site Employment Income	Adjusted Local Income from Traveler Expenditures	Total Basic Income	Induced Income	Total Economic Impact
Beaverhead	3.5	5.1	$65,898.0	$4,257	$70,155	$16,136	$86,291
Big Horn	2.0	2.9	36,812.0	4,289	41,101	27,127	68,228
Blaine	3.5	5.7	72,229.5	10,802	18,031	4,147	22,178
Broadwater	2.0	2.6	33,827.0	2,879	36,706	8,442	45,149
Carbon	2.5	4.3	45,128.5	3,773	48,901	11,247	60,148
Carter	3.5	4.2	72,229.5	2,025	9,255	2,129	11,383
Cascade	620.0	1496.2	13,011,942.0	2,208,627	15,220,569	15,524,981	30,745,550
Chouteau	12.0	15.4	242,581.0	10,444	253,025	58,196	311,221
Custer	18.0	31.3	378,151.0	32,212	410,363	270,840	681,203
Daniels	2.5	2.9	44,053.5	3,296	47,350	10,890	58,240
Dawson	5.0	10.2	106,142.0	29,688	135,830	89,648	225,478
Deer Lodge	5.5	8.0	109,293.5	2,422	111,716	73,733	185,448
Fallon	4.5	6.1	90,371.5	5,103	95,475	21,959	117,434
Fergus	28.0	38.1	585,419.0	13,797	599,216	395,483	994,699
Flathead	87.0	238.6	1,891,122.0	870,309	2,761,431	2,816,660	5,578,091
Gallatin	160.0	514.0	3,412,151.5	1,615,060	5,027,212	5,127,756	10,154,968
Garfield	1.0	1.4	20,637.0	1,588	22,225	5,112	27,337
Glacier	17.0	20.8	339,375.0	6,711	346,086	228,417	574,503
Golden Valley	0.0	0.0	0.0	214	214	59	264
Granite	1.0	1.4	20,637.0	1,886	22,523	5,180	27,704
Hill	10.0	21.2	219,125.0	22,829	241,954	159,690	401,644
Jefferson	0.0	0.1	0.0	1,311	1,311	301	1,612
Judith Basin	1.0	1.4	13,827.0	2,184	16,011	3,683	19,694
Lake	3.5	4.6	74,278.5	7,704	81,983	54,109	136,091
Lewis & Clark	489.0	1064.9	10,079,096.0	762,071	10,841,167	11,057,990	21,899,157
Liberty	10.0	11.9	206,370.0	4,329	210,699	48,461	259,159
Lincoln	0.5	1.4	8,068.0	5,858	13,926	9,191	23,116
Madison	4.0	4.9	74,236.0	4,329	78,565	18,070	96,634
McCone	0.5	0.8	10,318.5	2,621	12,940	2,976	15,916
Meagher	0.0	0.2	0.0	1,608	1,608	370	1,978
Mineral	0.0	0.1	0.0	2,601	2,601	598	3,199
Missoula	343.0	904.8	7,227,174.0	1,961,852	9,189,026	9,372,807	18,561,833
Musselshell	10.0	11.5	206,370.0	2,820	209,190	48,114	257,303
Park	8.5	12.9	173,291.5	7,009	180,301	118,998	299,299
Petroleum	0.0	0.0	0.0	0	0	0	0
Phillips	3.0	4.2	63,960.0	5,441	69,401	15,962	85,363
Pondera	3.0	3.8	61,911.0	5,540	67,451	15,514	82,965
Powder River	2.0	2.6	41,274.0	2,045	43,319	9,963	53,283
Powell	0.0	0.2	0.0	2,323	2,323	534	2,857
Prairie	0.0	0.2	0.0	1,469	1,469	338	1,807
Ravalli	9.0	12.1	196,968.0	12,311	209,279	138,124	347,403
Richland	16.0	31.9	338,888.0	123,478	462,366	305,162	767,528
Roosevelt	8.5	21.6	180,034.5	37,457	217,492	143,545	361,036
Rosebud	2.0	3.4	41,274.0	4,825	46,099	30,425	76,524
Sanders	0.0	0.2	0.0	3,137	3,137	722	3,859
Sheridan	1.5	3.0	30,955.5	5,242	36,198	8,325	44,523
Silver Bow	90.0	219.0	1,880,484.0	422,639	2,303,123	2,349,186	4,652,309
Stillwater	1.0	1.6	20,637.0	3,812	24,449	5,623	30,073
Sweet Grass	7.0	8.2	136,133.0	2,720	138,853	31,936	170,790
Teton	1.0	1.4	14,068.0	6,890	20,958	4,820	25,778
Toole	5.0	5.9	95,842.0	5,063	100,905	23,208	124,114
Treasure	0.0	0.0	0.0	318	318	73	391
Valley	20.0	36.1	425,118.0	46,520	471,638	311,281	782,919
Wheatland	0.0	0.1	0.0	1,906	1,906	438	2,345
Wibaux	0.0	0.0	0.0	0	0	0	0
Yellowstone	651.0	1,786.5	13,963,524.0	4,830,861	18,794,385	19,170,272	37,964,657
State Total:	2678.0	6592.9	$56,361,226.0	$13,142,508.3	$69,373,734	$68,158,940	$137,532,675

* No estimate of the economic benefits of federally-funded airport improvement projects were developed. Additionally, this analysis does not address aviation's enhancement of Montana commerce.

B. FINANCIAL RESOURCES

The purpose of this section is to identify financial resources and conditions at public airports within the State of Montana. There are four primary funding sources for airport improvements: federal, state, local, and private funding.

1. Federal Funding

Federal funding assistance for airport development is made possible through the Federal Airport and Airway Trust Fund. The Trust Fund revenues are generated through aviation user taxes and fees such as taxes on aviation fuel, tires, lubricating oil, and taxes on air cargo and commercial passenger fares. The largest portion of Trust Fund moneys are generated by the ticket tax on commercial passenger fares. The Trust Fund moneys are distributed through several funding categories. The federal funding categories most likely to be used for improvements in Montana are described below:

Air Carrier Entitlement Funds: This fund is used to assist primary airport improvement projects. Under the current Airway Improvement Act, each primary airport is guaranteed a minimum of $300,000 per year. A primary airport is defined as any airport having at least 10,000 enplanements annually. The actual amount of entitlement funds allocated to each primary airport is based on the number of commercial enplanements and the landed weight of cargo. Currently in Montana all of the entitlement funds come exclusively from passenger enplanements since none of the State's airports meet the 1 million cargo pound minimum necessary to receive entitlements based on cargo. Entitlement funds for Montana amount to approximately $4.75 million per year and are used for improvements at the State's 7 primary airports. The 1988 primary airport entitlement funds are divided up as follows: Billings $1,276,556; Great Falls $785,502; Missoula $752,890; Bozeman $663,317; Kalispell $474,895; Helena $395,803; Butte $300,000.[5]

State Apportionment Funds: Apportionment funds are allocated to each state based on geographic size and population. These funds are typically used for improvements to the GA airports but can be used for improvements to commercial-service and reliever airports as well. The apportionment funds are distributed to individual airports through the Airport Improvement Program (AIP) Grant process. The State received approximately $3.3 million of apportionment funds in 1988 for GA airport improvements.

Discretionary Funds: This category of funds can be used at any NPIAS airport for discretionary purposes. Of this allocation, 75% is to be used for capacity, safety, security or noise-related projects. The remaining 25% can be used for any FAA-eligible project. The amount of discretionary funds used each year in Montana varies based on the availability of funds and project priorities.

Commercial Service Funds This funding source consists of a state discretionary allocation to be used on commercial-service airports. Presently, Montana's commercial-service airports (Glasgow, Miles City, Sidney, and West Yellowstone) are eligible for this type of funding. A commercial-service airport is defined as any airport having scheduled commercial service and enplanements of at least 2,500 but less than 10,000 annually.

Reliever Airport Funds: Reliever funds are similar to commercial-service funds, except the discretionary allocation is to be used on reliever airports. Montana has no reliever airports and, therefore, does not receive any reliever funds at this time.

Essential Air Service (EAS) Program: The EAS Program was established by Congress as a result of deregulation of the commercial airline industry in 1978. The program insures that certain communities, important to the national system but capable of generating only limited passenger enplanements and cargo loads, would continue to receive commercial air service. The EAS Program provides subsidized air service to 8 Montana cities and towns: Glasgow, Glendive, Havre, Lewistown, Miles City, West Yellowstone, and Wolf Point. The program supplies subsidy funds to the airlines that serve the EAS communities. Approximately $1.3 million in subsidy funds was spent in 1988 for commercial air service at Montana's EAS airports.

The EAS Program has been approved by Congress for a 10-year term lasting until 1998. Unfortunately, the federal Office of Management and Budget did not appropriate enough funds to continue the program at 1988 levels. The DOT is in the process of revising the program to meet the lower appropriation limits. The revised program may have a significant effect on commercial service to Montana's 8 EAS communities. The DOT will establish the revised EAS Program early in 1989.

Airways Facilities and Equipment Fund: The federal government established this funding source to finance navigational improvements throughout the system. These funds are used for control towers, terminal radar service, VOR's, instrument landing systems, and runway approach lighting systems. All improvements or new installations financed through this fund are FAA installed and maintained. Approximately $9.4 billion was allocated for this fund in fiscal year 1988 for use nationwide.

Airport improvements in Montana are typically financed in part with entitlement, apportionment, and discretionary funds through the FAA Airport Improvement Program (AIP). Most airport development items such as land, runways, taxiways, and apron areas are eligible for 90% federal participation at public-use airports through the Airport Improvement Program. This percentage was established in the Airport and Airway Improvement Act of 1982. This Act authorizes federal funds to be spent on the development, expansion, and improvement of the nation's airport and airway system. This Act does not actually appropriate dollars for airport development but rather grants authorization for the FAA to appropriate funds each fiscal year. The current Airport and Airways Act is only good through 1992.

The total amount of federal dollars spent on airport development programs in Montana is shown in Table VII.6. This exhibit examines the federal grants from 1982 to the present for the State of Montana and shows the breakdown of total funding by apportionments, entitlements, and discretionary funds.

TABLE VII.6

MONTANA FEDERAL AIRPORT CASH FLOW

Year	Entitlement Funds	Apportionement Funds	Discretionary Funds	Total
1982	$2,150,616	$1,153,362	$1,390,084	$4,694,062
1983	$2,800,521	$1,537,816	$1,446,448	$5,784,785
1984	$3,566,540	$2,033,734	$3,812,274	$9,412,548
1985	$2,941,803	$2,336,856	$1,779,676	$7,058,335
1986	$5,059,241	$2,314,907	$2,136,649	$9,510,797
1987	$5,059,241	$2,566,110	$400,000	$7,382,195
1988[1]	$4,770,427	$3,255,689	$112,959	$8,139,075

1 1988 figures are estimates only and may be subject to change.

Source: FAA, Helena ADO.

2. State Funds

All state funds available for aviation-oriented programs are administered by the Aeronautics Division of the Department of Commerce. The state aviation programs are described below:

Airport Improvement Loan Program: This program was made possible through the sale of State General Obligation bonds in 1985. Approximately $1.3 million is available for loans to any publicly-owned airport in the state at the fixed interest rate of 7.109%. The maximum loan limit set by the State Legislature is $150,000 per project. All loans must be repaid by July 1, 1995 when the program expires. A loan made in 1988 would, therefore, have a 7-year term. The state loan money can be used to finance any airport-related project.

Preliminary Engineering Grant Program: This program was established to assist Montana's local airports with development projects. Through this program, $10,000 per year is available for preliminary engineering assistance. The grants are limited to $1,000 per recipient with the State typically issuing 10 of these $1,000 grants per year.

NDB Program: State assistance is available for the installation of non-directional radio beacons. The State typically installs one NDB system per year costing approximately $12,000 to $13,000 each. The program will fund up to 90% of the cost of the new NDB installation with the local airport financing the remaining share. In many cases, the local share consists of labor or materials provided by the airport. The amount of State financing varies from project to project depending on the capabilities of the local airport.

Unicom Program: State assistance is available to local airports for purchasing new unicom systems or upgrading existing systems. A new unicom complete with antenna costs approximately $1,500. This program provides a 50/50 cost share with the local airport. The State typically provides funds for two systems per year. There are approximately 60 airport unicom stations in operation statewide.

Airway Beacon Program: This program provides the funding necessary to operate and maintain 18 airway beacons located in the mountainous areas of Montana. It costs approximately $765 annually to operate and maintain each beacon in the system. The State is in the process of replacing the old electronics on each beacon with new energy efficient systems which will lower the annual operating cost to $500 per beacon. Historically, the airway beacons have provided invaluable navigational assistance to VFR aircraft making night-time flights through the mountain corridors of Montana.

Operation of State-Owned Airports: The State currently owns, operates, and maintains 14 public airports. These airports include 1 commercial air-service airport (West Yellowstone), 3 border crossing airports which provide customs service (East Poplar, Ross International, and Whetstone International at Del Bonita), and 10 airports that provide service and access to various local communities and recreation areas (Babb, Canyon Ferry, Deli, Lavina, Lincoln, Oxbow, Rock Creek, Ryegate, Starr-Browning, and Tiber Dam).

The airport at West Yellowstone generates enough revenue from user fees to provide for the operation and maintenance of the airport. The other 13 airports generate only a minor amount of revenue through hangar rentals.

Search and Rescue Program: The Montana Aeronautics Division organizes and coordinates the search and rescue efforts for downed aircraft. This program provides the financing for this service as well as reimbursement funds for aviation fuel and oil used by aircraft involved in the search and rescue effort. The amount of money spent through this program varies from year to year. In fiscal year 1988, approximately $10,600 was used for search and rescue.

Resale Program: In an effort to lower airport maintenance costs, the State purchases a variety of commonly-used airport hardware in bulk at a reduced price and resells the items to local airports at the lower bulk rate. Program items include wind socks, runway and taxiway light bulbs, beacon light bulbs, and turf runway cone markers. The State operates this program on a breakeven basis.

Aircraft and Pilot Registration Program: In 1987 the State Legislature directed Montana Aeronautics to provide for the registration of all state-based aircraft and all resident pilots. This program was created to provide property tax relief to aircraft owners. In the past, aircraft were subject to county property taxes which were considered to be excessive and resulted in the loss of many private and corporate aircraft from the state. The new registration fee is in lieu of a property tax. The fee is based on the age and type of aircraft. Of the revenue produced from this fee, 90% is returned to the counties while the Aeronautics Division retains 10% of the funds to cover the cost of administering the program.

5010 Inspection Program: The State contracts with the FAA to perform 90 airport inspections per year. These on-site inspections provide a record of the facilities that exist at each airport and the condition of these facilities. The annual contract for these services is approximately $20,000.

In addition to the above-mentioned programs, the Aeronautics Division also offers a variety of educational and flight safety programs and provides technical assistance to the general public as well as airport development assistance to communities interested in constructing, maintaining, or upgrading a local airport.

Revenues for the Montana Aeronautics Division are generated through several mechanisms. The airport improvement loan program funds come from the sale of State General Obligation Bonds. The 5010 inspection program is financed through an annual contract with the FAA. All other programs and administrative costs are financed through a one cent per gallon tax on all aviation fuel sold in the state. These gas tax revenues generate approximately $325,000 annually. Since 1986, the Aeronautics Division has received an auto fuel tax reimbursement (1/25th of a cent per gallon) which amounts to about $29,000 a year. Additional revenues are generated through loan repayments to the Aeronautics Division for $185,000 in outstanding loans. This is temporary revenue and will no longer be available when the loans are repaid.

A listing of the annual revenue and expenses for the Montana Aeronautics Division is presented in Table VII.7.

It is interesting to note that the Aeronautics Division's budgeted annual expenses exceed the annual revenue by over $100,000 each year. The short fall in revenues is made up with aviation gas tax reserve funds which accounts for the beginning balance each year. These gas tax reserves were generated during the 1950's and 1960's when the military flight activity at Glasgow and Malmstrom Air Force Bases was significant. These surplus funds have been used since the mid-1960's, when military activity subsided, to balance the Aeronautics Division's budget. The surplus gas tax funds will be depleted by 1991, causing a revenue shortage of $110,000 in that fiscal year.

TABLE VII.7[6]

MONTANA AERONAUTICS REVENUE AND EXPENSE

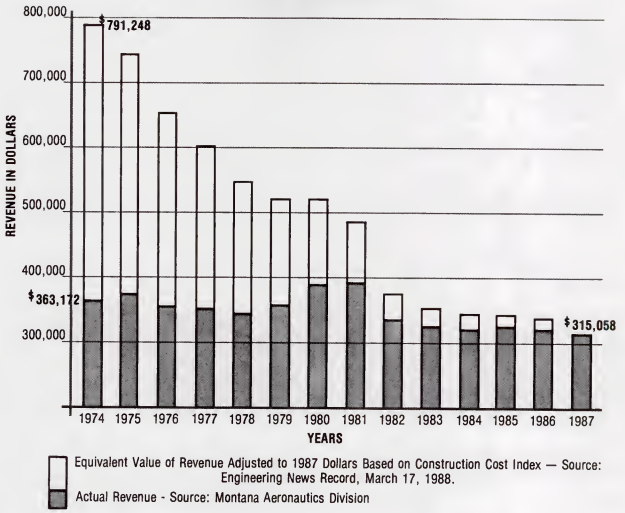
	FY88 (Actual)	FY89 Budgeted)	FY90 (Projected)	FY91 (Projected)
Beginning Balance	$282,071	$267,174	$130,608	$ 9,864
Revenues				
Aviation Fuel Tax	327,252	327,252	327,252	327,252
Automobile Gasoline Tax	34,044	30,000	30,000	30,000
5010 Contract	20,350	20,350	20,350	20,350
Receivables (from old loan prgm.)	79,307	61,000	54,000	30,000
Interest (from old loan prgm.)	12,232	9,000	6,000	3,000
Aircraft Registration (total receipts)	288,767	297,922	297,922	297,922
Miscellaneous Income	46,016	46,000	46,000	46,000
Total Revenue	$807,968	$791,524	$781,524	$754,524
Expenses				
Administration Costs of Operating the Aeronautics Division and their Programs	$565,585	$659,960	$634,138	$606,735
Accounting Adjustments	2,565	0	0	0
90% of Aircraft Registration to Counties	259,845	268,130	268,130	268,130
Total Expenses	*$827,995	$928,090	$902,268	$874,865
Ending Balance	$267,174	$130,608	$ 9,864	($110,477)

* The actual expenses for FY 88 represent only 88% of the budget. This is primarily due to personnel positions that were vacated in 1988 that have not yet been filled.

Source: Martha Kurtz, Department of Commerce, Aeronautics Division, Helena, Montana.

The aviation gas tax revenues are obviously providing the greatest source of revenue. Since the tax is one cent per gallon and not a percentage of the cost of a gallon of fuel, the State has not benefited from increased fuel prices. The actual amount of revenue generated from aviation gas taxes has decreased steadily over the past 10 to 15 years. Figure VII.1 shows the historical revenues generated by this fuel tax.

Figure VII.1
State Aviation Fuel Tax Revenues



3. Local Funding

Local communities are responsible for the cost of their airport. Historically, the FAA and the State have provided financial assistance for certain airport improvements. Even with this financial assistance, the local cost for airport improvements is often a burden on the community.

Local funds for public airports can only be generated through property taxation or revenue-producing activities at the airport. Enabling legislation in Montana allows cities and/or counties to establish an airport fund property tax levy of up to two mills

for airport construction, operation or maintenance. This levy may be implemented in addition to any allotment the airport may receive from local government general fund mill levies. Revenue generated by these mill levies may vary each year due to variations in the taxable valuation of property in municipalities and county areas. New legislation intended to provide property tax relief to Montanans has "frozen" property taxes at 1986 levels.

Local funding may be generated by revenue-producing operations at the airport. The typical revenue sources of air carrier and general aviation airports in Montana include concessions, fuel flowage fees, facility or land rental fees, hangar rental and tie-down fees, landing fees, and income from agricultural products or uses of the airport property. Airport revenues from these sources are offset by the expenses of operating aviation facilities. Revenue must exceed the cost of airport operations if surpluses to fund the local share of an airport development program are to be available. Some airports have been aggressive in developing on-site revenue and have been very successful.

The Local Government Services Division of the State Department of Commerce requires each city and county to submit an annual financial statement for auditing purposes. These financial reports were reviewed in an effort to better define the amount of local funds that are generated for airports in Montana. Table VII.8 lists the airport-related revenues of the cities and counties that operate state system airports in Montana.

The figures represented in Table VII.8 indicate approximately $11.3 million of local funds are generated each year. These moneys must pay for operating, maintaining, and insuring local airports. It is interesting to note that on-site revenue generating activities account for 80% of all local airport revenue. Of the total local revenues, approximately $9.6 million are generated for the 7 primary airports leaving only $1.7 million for all the other airports in the state. In the case of many small general aviation airports, the local revenues are completely expended on maintaining the airport leaving little or no funds available for major improvement projects. For airports in this situation, it is very difficult to accumulate sufficient cash reserves to fund the local share of an FAA-sponsored improvement project.

TABLE VII.8

LOCAL GOVERNMENT REVENUES
FY 1987

County and Cities	Taxes: General Fund	Taxes: Airport Fund	Revenues from On-Site Activities	Total
Beaverhead		$ 23,773.00	$ 2,972.00	$ 26,745.00
Big Horn	$ 25,680.19			25,680.19
Blaine		42,495.48		42,495.48
Broadwater		5,261.99	1,681.00	6,942.99 *
Carbon		49,301.48	1,160.00	50,461.48
Bridger (1986)		593.93		593.93
Carter		14,293.52	1,150.00	15,443.52
Cascade		60,166.00		60,166.00
Great Falls		165,386.00	1,380,000.00	1,545,386.00
Choteau		46,110.00	1,000.00	47,110.00 *
Custer		24,245.68		24,245.68
Miles City			40,098.69	40,098.69
Daniels		13,657.05	20,989.13	34,646.18
Dawson		58,219.05	10,314.49	68,533.54
Deer Lodge	5,427.18			5,427.18
Fallon (1986)		57,772.31	1,518.08	59,290.39
Fergus		1,835.69	56,814.79	58,650.48
Flathead		191,067.00	600,941.00	792,008.00*
Kalispell			3,152.00	3,152.00
Gallatin		61,431.00	369.00	61,800.00*
Bozeman		138,072.00	1,011,613.00	1,149,685.00
Garfield (1986)		366.77		366.77
Glacier		56,990.00		56,990.00
Cut Bank		4,438.61		4,438.61
Golden Valley		1,393.18		1,393.18
Granite		5,272.90	144.00	5,416.90
Hill		127,714.00		127,714.00
Jefferson				0.00
Judith Basin		16,967.73		16,967.73
Lake		65,420.72	10,000.00	75,420.72*
Lewis & Clark		132,036.27		132,036.27
Helena			855,625.00	855,625.00
Liberty		6,059.32	10,254.42	16,313.74*
Lincoln		83,539.00	16,939.00	100,478.00
Madison		32,651.35		32,651.35
McCone			9,500.00	9,500.00*
Meagher				0.00
White Sulphur		831.30		831.30
Mineral		1,156.29	83.00	1,239.29
Missoula		336,011.00	1,501,757.00	1,837,768.00*
Musselshell		5,600.00	2,400.00	8,000.00*
Park		13,024.18	27,666.42	40,690.60
Petroleum				0.00
Phillips		4,195.68	65,768.22	69,963.90*

TABLE VII.8 (CONT.)

LOCAL GOVERNMENT REVENUES
FY 1987

County and Cities	Taxes: General Fund	Taxes: Airport Fund	Revenues from On-Site Activities	Total
Pondera			$ 18,509.71	$ 18,509.71*
Powder River	$ 9,539.74			9,539.74
Powell		$ 3,404.22	1,345.00	4,749.22
Prairie				0.00
Ravalli		9,325.14	6,691.33	16,016.47
Richland		119,232.00	7,209.00	126,441.00
Roosevelt		32,880.17		32,880.17
Rosebud		21,462.27	5,734.40	27,196.67
Sanders		9,874.07	4,464.76	14,338.83
Sheridan		12,075.47		12,075.47
Silverbow		74,000.00	446,000.00	520,000.00*
Stillwater	1,025.00		1,125.00	2,150.00*
Sweetgrass		10,230.22	1,126.95	11,357.17
Teton		7,621.15		7,621.15
Toole		21,667.00	14,417.00	36,084.00*
Treasure	106.00			106.00
Valley		45,557.85	34,691.32	80,249.17
Wheatland		6,392.33	110.69	6,503.02
Wibaux				0.00
Yellowstone				0.00
Billings			2,790,469.00	2,790,469.00
Laurel		25,068.00		25,068.00
TOTALS	$41,778.11	$2,246,139.37	$8,965,804.40	$11,253,721.88

* Information supplied from Airport Manager, County and/or City Treasurer's Office.

Source: Local government annual financial statements on file with the Montana Department of Commerce, Local Government Sources Division.

4. Private Funding

Certain portions of the recommended development program are often absorbed by private funding. Items such as T-hangars and some terminal areas which are not eligible for federal funding because these areas are revenue-producing sources are sometimes financed with private funds. The calculation of future private airport funding for the State of Montana is difficult because there are too many variables to produce an accurate estimate. There is no single factor that can be accurately used to determine how many private dollars will be available for future airport development.

Historically, private funding has only played a minor role in financing public airport improvements. Typically, private funds do not surface unless an individual or company has a greater need for a particular improvement than the community in general. In these cases, it is possible that items such as runway construction or rehabilitation would be principally funded through private sources. Unfortunately, the unique circumstances necessary to generate large sums of private moneys for improvements are rare and unpredictable.

C. FINANCIAL OPTIONS

1. Federal Funding Options

Federal aid programs are rigidly structured with specific eligibility requirements that limit the number of funding options available. Montana should insure that all available federal funds are utilized. This has not been a problem in the past and historically Montana does not turn money back to the federal government for lack of an eligible project. In the last few years there have been several cases where a federally-funded project fell through because the airport could not come up with the 10% local matching share.

The current Airport and Airways Act is in effect until 1992 at which time a new act will be drafted. It is likely that the new airport improvement program will change somewhat and may affect the level of assistance available for Montana.

One way to actually increase the amount of federal funds available for Montana is to convince the U.S. Congress to totally separate the Airport and Airways Trust Fund from the General Fund. It has become common practice for Congress to use the principal and interest from the Airport and Airways Trust Fund in an effort to balance the General Fund. The aviation industry should insist that the user fees in the trust fund as well as any interest revenue be used within the aviation system.

2. State Funding Options

In Montana the majority of the State aviation revenues have traditionally been generated through a one cent per gallon aviation fuel tax. This user fee was established at that rate in 1945 when aviation fuel sold for 26 cents per gallon. At that time, the user fee represented 3.8% of the cost of fuel. Today with aviation fuel prices of approximately $1.75 per gallon the user fee represents less than 6/10ths of one percent of the cost of fuel. It is also interesting to examine the historical value of the revenue generated from the aviation fuel tax. If the original one cent per gallon tax was adjusted for inflation, the fuel tax would now have to be over 14 cents per gallon to yield the equivalent value of the original tax.

A user fee such as the aviation fuel tax is a very common method of generating funding for airports. Currently, 49 of the 50 states have some form of fuel tax; Texas being the only state with no tax. Table VII.9 lists the fuel taxes in effect in states that border Montana and those states with direct airline connections to Montana cities.

TABLE VII.9[7]

AVIATION FUEL TAXES IN OTHER STATES

State	Fuel Tax
Idaho	3.5 cents per gallon jet fuel and av gas; 14.5 cents per gallon on auto gas with 11 cents refundable
Wyoming	4 cents per gallon jet fuel and av gas; 8 cents per gallon on auto gas
North Dakota	8 cents per gallon on jet fuel and av gas, refundable up to 4% of purchase price
South Dakota	4 cents per gallon on jet fuel; 6 cents per gallon on av gas and auto gas
Washington	3% or 5 cents per gallon on GA av gas and GA jet fuel; 7.4% sales tax on all commercial av gas and jet fuel
Utah	4 cents per gallon jet fuel, av gas, and auto gas
Colorado	3% sales tax on jet fuel (equal to 5.4 cents pr gallon at current prices)
Minnesota	Sliding scale on jet fuel, rate based on annual consumption - >200 K 1/2 cent per gallon

It is important to note that the Aeronautics Division has historically balanced their budget through the use of surplus aviation fuel tax revenues that were generated during the 1950's and 1960's. These reserve funds will be depleted by 1991 creating a major revenue shortage for the Aeronautics Division.

Based on this information, it is apparent that additional revenue will be necessary if the Aeronautics Division's programs are to continue at the same level as in the past.

There are several funding mechanisms other than the aviation fuel tax that could be used to generate additional revenue for state aviation programs including: the State General Fund, Coal Tax Revenues, Automobile Fuel Tax, a General Sales Tax, and Economic Development Funds.

3. Local Funding Options

One option available to local airports is to maximize the usage of the various funding sources that currently exist. County and city property tax mill levies for local airport funds can be increased to 2 mills, which is the legislated taxable limit. Unfortunately, current legislation that froze property taxes at the 1986 level make it difficult to increase the airport fund levy. An increase in the airport fund levy requires a similar decrease in the levies for other local funds in order to achieve a total property tax rate that does not exceed the 1986 level.

The local airport should be operated as a business. Typical airport use fees such as landing fees, tie-down fees, and hangar lease fees can generate steady income for a local airport. Whenever possible, airport operators should endeavor to generate additional revenue through intensifying the use of underdeveloped airport property. Obviously, careful planning must be used in developing non-aviation land uses adjacent to the airport. However, for many general aviation airports, maximum use of this property could provide a significant portion of airport operating revenues. Some strategies for successful non-aviation uses for airport property include:

- Developing warehouse space from unused or aging hangars
- Agricultural use of vacant lands
- Industrial park development
- Pay parking lots
- Encouragement of flight school development

Non-aviation uses of airport property should be confined to short-term lease arrangements, and the FAA should be contacted to ensure the non-aviation uses are compatible with all federal grant agreements.

These are only some of the possible uses for underdeveloped airport property. Each airport must evaluate the worth of current non-aviation land uses and determine if that land could be put to better use. Land-use options will vary by airport based on its location and intensity of existing uses. Each airport should tailor the use of its land according to the airfield layout, future expansion plans, and the economic conditions in the local area. If certain airport properties are aggressively and wisely developed, airport operators can achieve substantial revenue gains.

Probably the best option for generating significant funds for local airport improvements is to support the state aviation fuel tax increase and the creation of the 5% grant program mentioned in the previous subsection.

4. Private Funding Options

Private financing of airport improvements is rare and difficult to anticipate. It is important to keep the private sector informed about future airport development plans and local airports should encourage private individuals and businesses to take an active role in the planning effort. Local understanding and support of an improvement project is necessary for private funding to become a reality. Those individuals that stand to benefit the most from a project will only provide the needed funding if the benefits are great enough and they realize all other financial sources have been considered.

ENDNOTE REFERENCES - CHAPTER VII

1. Montana Department of Labor and Industry, Montana Employment, Wages and Contributions, Quarterly Report, Annual Averages, 1984, 1985, 1986. Helena, Montana. 1985, 1986, 1987.

2. U.S. Department of Commerce, Bureau of Economic Analysis. Regional Economic Information System, Montana Counties, 1986. Washington, D.C. 1987.

3. Richard T. Dailey. Montana Travel Industry, 1983. Bureau of Business and Economic Research, University of Montana. Missoula, Montana. 1984.

4. Chalmers, James, Anderson, Beckhelm, and Hannigan. An Empirical Model of Spatial Interaction In Sparsely Populated Regions. Mountain West Research, Inc. Billings, Montana. 1977.

5. Susan Alexander, Planning/Program Officer, FAA, Helena District Office. Personal communication, August 24, 1988.

6. Martha Kurtz, Administrative Assistant, Department of Commerce, Aeronautics Division. Helena, Montana. Personal communication, August 25, 1988.

7. Texas Aeronautics Commission, Fuel Tax Summary. April, 1988.

Chapter VIII

Recommended Aviation System Plan

CHAPTER VIII: RECOMMENDED AVIATION SYSTEM PLAN

All aspects of the aviation system were examined during the development of this plan. The needs of the individual airports were examined in Chapter V and the system requirements defined in Chapter VI. The problems and deficiencies within the system were defined, then the appropriate corrective measures were identified.

This chapter includes recommendations that address identified deficiencies in the system. Also included in this chapter is the recommended prioritization of the individual airport improvements.

A. DEFICIENCIES IN EXISTING AVIATION SYSTEM

The facilities and services that collectively form Montana's aviation system were reviewed in an effort to identify system deficiencies. The deficiencies identified in this section have not been listed in any particular order and do not reflect any priority ranking. The elements of the system found to be deficient are listed below:

- The Loran system of navigation is not available in many areas of eastern Montana. This is caused by a gap in coverage provided by the current network of Loran stations. This deficiency is being addressed by the FAA which plans to install an additional Loran station in the Havre area in the fall of 1990.

- The cities and counties of Montana have only limited financial resources available for airport improvements. With property tax mill levies frozen at the 1986 level, it will become increasingly harder for communities to properly maintain their airport while accumulating the 10% local matching share needed for a federally-assisted improvement project.

- Forty-three public-use airports in Montana are not included in the FAA's National Plan of Integrated Airport Systems (NPIAS). These non-NPIAS airports are not eligible for federal assistance and can expect only limited financial assistance through the current state programs. Without financial assistance from the federal or state governments, any improvements to the non-NPIAS airports will be very difficult to accomplish with limited local revenues.

- Financial assistance for airports through the FAA is limited to major improvements and does not include funding for routine maintenance. As a result, many airports do not maintain their facilities at the level desired.

- The Montana Aeronautics Division currently uses the statewide budgeting and accounting system required of all state agencies. Unfortunately, this type of accounting system does not allow the Aeronautics Division to identify the total cost of operating the individual aviation assistance programs that are administered by the Division. Without the necessary accounting data, it is difficult to accurately assess the value of the state programs.

- The Montana Aeronautics Division and its programs are facing a significant revenue shortage in the near future. Without adequate funds, the State assistance programs will have to be reduced or discontinued. The result will be an increased financial burden on local airports that are already having trouble generating needed revenues.

- Commercial air service in Montana is constantly changing as the airline companies move in and out of the state in search of the most lucrative markets. Since deregulation of the airline industry in 1978, Montana has experienced instability in service and fares. At many locations the type of air service has changed from big jets to commuter-size aircraft. Montana must have stable, affordable air service to compete in today's marketplace.

- Many of Montana's smaller airports do not have public telephone service. Without a telephone at the airport, the aviation traveler is unable to make ground transportation arrangements and is essentially stranded.

- Ground transportation services are not available at most of Montana's airports. The lack of reliable surface transportation into town is a significant drawback to aviation travel.

- The current method of establishing aviation operations at Montana airports uses estimates made during annual 5010 inspections. These estimates have been found to be unreliable and do not represent an accurate assessment of the activity level at many airports. Accurate aviation operations data is essential when planning and prioritizing future improvements to the system.

- The recording methods used by the FAA to establish airport instrument activity levels do not produce reliable data. The FAA only counts actual instrument landings which greatly underestimates instrument activity at a particular airport. The number of instrument operations at an airport is a significant factor when evaluating the need for instrument facilities.

- Over the past few years there has been a notable decrease in the state's involvement in federally-funded GA airport improvement projects. The State has provided little input in deciding the direction of GA airport improvements in Montana in recent years primarily because of the lack of financial participation in the improvement programs.

- The consolidation of the flight service stations in Montana is scheduled to begin in 1990. The most significant problems experienced in other states where the consolidation of flight service has occurred is the loss of personalized service and excessive delays when trying to access the system by telephone. Similar problems are likely to occur in Montana as a result of the consolidation.

- The FAA plans to change the way weather data is collected in Montana. After the consolidation of the manned flight service stations, the FAA will begin replacing human weather observers with automated weather data collection equipment. A problem experienced in several other states that have automated weather systems is the lack of enough data collection points to provide detailed weather information for many remote areas of the state. The most notable limitation of the AWOS equipment is that it only records the current weather conditions immediately above the recording station. The AWOS does not provide data on weather conditions in the surrounding area which is currently available from the manned observers. Montana may experience a situation where the new AWOS generated data does not provide enough detail of the varying conditions in the state, especially in the mountainous regions of western Montana.

- In many Montana communities, there is a distinct lack of interest in local airport improvements. Often the only citizens interested or even aware of proposed changes at the airport are the local pilots and people who work at the airport. Most people in the community are unaware of the various benefits of the local airport and the cost associated with maintaining such a facility.

- The general aviation airports are not collectively represented in any of Montana's aviation organizations. Many local airports are not members of Montana Airport Managers Association (MAMA) and do not take advantage of this forum to express the needs of Montana's local airports.

- The system of communications between pilots and local GA airports is provided by Unicom operators at the airport or at a location in town. The Unicom radio stations provide vital data to pilots pertaining to current wind conditions and local air traffic. There are approximately 70 community-operated Unicom stations and 10 private Unicom stations throughout Montana. Because of a lack of minimum standards, the Unicom service being provided can vary widely from airport to airport. In some locations the Unicom frequency is monitored sporadically for only a few hours throughout the day providing inconsistent service to the flying public.
- The current laws in the state of Montana do not adequately protect the local airports with respect to land use zoning.
- There is a need to increase the on-site revenue generated at our local airports.
- There are no minimum standards for our GA airports. The services and facilities available at our system of GA airports vary widely from location to location.
- There are major gaps in th VOR coverage in eastern Montana in the areas of Jordan and Broadus.
- The Montana Aeronautics Board is a 9-member advisory board. The size of the board is out of proportion with the size of the Montana Aeronautics Division which currently has only 8 employees. The adivsory status of the board limits its ability to make changes in the agency it oversees.

B. RECOMMENDED SYSTEM IMPROVEMENTS

The recommended improvements contained in this section address the system deficiencies identified earlier in this chapter. The recommendations contained herein have not been prioritized and are listed in random order. Recommendation numbers have been assigned for reference purposes only.

Recommendation No. 1

A 5% grant program should be created at the state level to be used to assist all airports involved in federal airport improvement projects. The proposed state grant program will reduce the financial burden on local airports by providing half of the required 10% sponsor share on AIP projects. Assistance from the State with major improvement projects will allow more local funds to be allocated for maintenance. This grant program will require approximately $450,000 annually to match the FAA program funds.

Recommendation No. 2

A new State grant assistance program should be created to aid the development of non-NPIAS airports. It is recommended that a 50/50 grant program be established to help small community airports with major improvements.

Recommendation No. 3

The State should create a 50/50 grant assistance maintenance program which could provide matching funds for pavement maintenance projects at our GA airports, such as pavement crack sealing, fog sealing, chip sealing, and runway painting. These types of maintenance items are essential to prolonging the life of airport pavements.

Recommendation No. 4

The Montana Aeronautics Division should develop a supplementary cost accounting system that will provide a complete record of all costs associated with each of the State's programs. Complete accounting records are essential to any successful business or agency. An improved accounting system will provide data necessary to accurately assess the cost effectiveness of each state program.

Recommendation No. 5

The State Aeronautics Division's programs and services should be evaluated to determine if current programs are providing necessary services in the most economical and efficient manner possible.

Recommendation No. 6

A commercial air service monitoring program should be developed. The program should include monitoring the airline passenger service currently being provided in Montana and an assessment of the type and amount of commercial service that is sustainable in the various communities throughout the state. The program should be developed and endorsed by the aviation community and used as a marketing tool to encourage the airline industry to provide the kind of passenger service that will best serve Montana.

Recommendation No. 7

It is strongly recommended that all community airports have a public telephone available. If vandalism is a problem, the telephone could be located inside the pilot's lounge which is secured with a radio-activated door lock similar to the facility at the Harlem Airport. It may be possible to encourage some local businesses to sponsor an airport telephone by allowing them to advertise their business on the wall space near the telephone.

Recommendation No. 8

Airport communities should examine the possibility of providing airport ground transportation. If possible, any public transportation system in a community should serve the airport. Private taxi and bus companies should be encouraged to make their services available to airport customers. Most of Montana's small communities do not have a public bus system or taxi company. These communities should encourage local hotels and restaurants to provide courtesy shuttle service from the airport into town. A local business or business group

could sponsor the purchase of a community shuttle bus which could be driven by local volunteers. These kinds of ground transportation will encourage the aviation traveler to visit the community and thereby enhance local economy.

Recommendation No. 9

The State should initiate an acoustical counting program. With only a few counting devices and an efficient counting schedule, the State could survey the untowered airports and develop accurate airport operations data which is essential to all aspects of airport planning and development.

Recommendation No. 10

The FAA should develop a recordkeeping system to accurately assess the instrument activity occurring at Montana's airports.

Recommendation No. 11

The policies of the Montana Aeronautics Division should require all master plans, airport layout plans, construction plans, and as-built drawings for GA airports be submitted to their agency for review and comment. The master plans and airport layout plans of the primary airports should also be submitted to the Aeronautics Division for their records. The State should monitor the developments taking place at Montana's airports to insure the best possible system of facilities are available throughout the state.

Recommendation No. 12

An education and awareness program should be created to inform Montana's pilots of the changes that will occur with flight service as a result of the consolidation of the FSS. The best approach to the consolidation effort is to minimize the confusion and concerns about the new system through seminars held prior to the system change. Providing information to pilots about how the system works and how to use it will minimize the time necessary for pilots to adjust to the changes. It is also recommended that remote computer terminals, linked to the main automated flight service computer, be installed at airports that have the highest activity levels. This will allow experienced pilots direct access to weather and flight information and free up the telephone access for those pilots that need additional assistance.

Recommendation No. 13

A weather plan should be developed by the Aeronautics Division that examines the weather data needs in the state. It should review the FAA's plans for automated weather data collection equipment in Montana and define the adequacy of their proposed AWOS conversion. New developments in weather data collection should be examined such as automated surface observation systems (ASOS) and the next generation radar system (NEXRAD). The weather plan should identify the limitations of the automated equipment and determine where

the weather data collection stations should be located in order to provide complete weather information for all areas in Montana.

Recommendation No. 14

Local airports should develop a continuing public relations campaign in their communities. It is essential local citizens are aware of the benefits to their community from the airport. The airport should place public service announcements on local radio or television stations to promote the airport and inform the public about development plans. A video currently being produced by the aviation organizations of Montana (AOM) will provide local airports with a valuable public relations tool.

Recommendation No. 15

The owners and operators of small GA airports should be encouraged to voice their opinions and concerns on aviation issues by utilizing easily accessible forums such as aviation conferences, FAA District Office seminars, and local aviation publications. Aviation-interest groups should solicit comments on pertinent issues from the people who represent the system of GA airports. Their input on aviation issues will help determine what is best for Montana's GA airports.

Recommendation No. 16

A set of minimum operating guidelines for airport Unicom stations should be established. The guidelines should include the minimum qualifications of the operator and the recommended hours of operation. The State should encourage guideline compliance through the enforcement of the Unicom lease agreements.

Recommendation No. 17

Montana's zoning statutes should be reformed to better protect the activities conducted at the airport and to control land use in its vicinity.

Recommendation No. 18

The community airport should be operated like a business utilizing its various resources to generate on-site revenue. A review should be made of the potential use of landing fees, tie-down fees, hangar rentals, and short-term lease agreements for compatible, non-aviation uses of portions of the airport property. The airport should encourage the local fixed-base operator to provide a variety of quality services to the public which will attract the flying public to the airport and thereby increase the potential for additional revenue through airport use fees.

Recommendation No. 19

A set of minimum standards for GA airports should be developed which would include the services and facilities that are desirable at GA airports. Items such as navigational aids, communications, instrument capabilities, aviation fuel ser-

vice, public telephones, ground transportation, and other pilot services should be considered in developing the standards.

Recommendation No. 20

Two additional VOR stations should be constructed in Montana; one in the Jordan area and the other near Broadus. These additional VOR stations will provide the cross-country pilot with continuous VOR guidance throughout eastern Montana.

Recommendation No. 21

The Board of Aeronautics should be restructured so it is empowered to set general policy and review the function of the Montana Aeronautics Division and its programs. The size of the board should also be reviewed. Perhaps, a smaller board consisting of 3 to 5 members would be more efficient.

C. PRIORITIZATION OF INDIVIDUAL AIRPORT RECOMMENDATIONS

The individual airport recommendations were developed in Chapter V. The cost of these recommended improvements far exceeds available funds. Therefore, it is necessary to prioritize the projects to determine the order of implementation.

The 7 primary airports receive entitlement funds based on their annual passenger enplanements. Since the primary airports do not compete for entitlement funds, no prioritization of primary airport improvement projects is necessary. It is assumed these airports are aware of their own priorities and will implement planned improvements as funds are available. This is also true of the commercial service airports such as Sidney and West Yellowstone that rely exclusively on commercial service funds to finance their improvement projects.

Similarly, non-NPIAS airports receive virtually no state or federal financial assistance and, therefore, do not compete for project funding. The recommended improvements at the state's non-NPIAS airports should be implemented as local funds become available.

All of the non-primary NPIAS airports compete for federal apportionment funds. It is this group of airport improvement projects that require prioritization. Only the FAA-eligible projects that have been tentatively scheduled for the first 5 years have been prioritized. Prioritization of the projects was accomplished using the established FAA planning methods which rank the project based on the type of improvement. The highest ranked projects involve safety and improvements to the main runway followed by improvements to secondary runways, taxiways, apron areas, etc. For the purposes of this study, it was assumed all work elements of a particular project will be implemented at the same time. A detailed explanation of the FAA

project prioritization procedure is contained in Airport Improvement Program (AIP) Handbook (Order No. 5100.38).

The projects that will compete for federal apportionment funds during the next 5 years are presented below. The list is based on airport needs without regard to the sponsor's ability to finance the local share of the improvement costs. It is presumed the airports listed meet the FAA airport standards or will be developed to the standards as a result of the proposed improvement project. The list represents only a general order of priority and is intended to be continuously updated and adjusted as new information becomes available or conditions change. The list reflects an emphasis on safety-related items and standard development projects which were considered to be a high priorty.

Only the major work items of each project have been identified. The final eligibility of the actual work items will be determined by the FAA at the time the project is programmed for funding. It was assumed that the level of apportionment funding will remain at the 1989 level ($3.6 mill per year) throughout the 5-year prioritization period.

TABLE VIII.1

RECOMMENDED PRIORITIZATION SCHEDULE

Airport	Improvement Description	Estimated Cost
Laurel	Reconstruct, widen and extend 3/21; improve safety areas;	$ 650,000
Hamilton	Correct pavement frost heaving problems; acquire land and extend R/W 16/34 and parallel T/W; construct new T/W to access hangar area; rehabilitate all paved areas; expand apron area	1,025,000
Cut Bank	Remove excess pavement from 13/31; rehabilitate 4/22, 13/31, T/W's, and apron; improve safety areas	1,000,000
Lewistown	Extend 7/25; rehabilitate 2/20, apron areas, and T/W's; fence; construct water system	1,015,000
Chinook	Master Plan underway; develop airport to standards outlined in Master Plan	1,350,000
Shelby	Extend 11/29 and rehabilitate 5/23; construct parallel T/W and improve safety areas	500,000
Anaconda	Pave and extend 16/34; construct connecting T/W and install MIRL, glide slope indicators, and perimeter fencing	750,000
Ronan	Complete construction of airport (continuation of existing project)	300,000
Miles City*	Relocate county road and fence; acquire additional snow removal equipment	100,000
Plentywood	Rehabilitate all paved areas; construct parallel T/W	500,000
Ennis	Master Plan underway; develop airport to standards outlined in Master Plan	1,130,000
Harlem	Rehabilitate 11/29 and T/W; improve safety areas	185,000
Eureka	Master Plan underway; upgrade airport to standards outlined in Master Plan	800,000

* Airport may be eligible for commercial-service funds.

TABLE VIII.1

RECOMMENDED PRIORITIZATION SCHEDULE

Airport	Improvement Description	Estimated Cost
Choteau	Rehabilitate all paved areas and extend 5/23; improve safety areas; relocate county road; relocate land fill; install glide slope indicators and perimeter fence	$ 600,000
Townsend	Master Plan underway; develop airport to standards outlined in Master Plan	760,000
Harlowton	Rehabilitate and widen 8/26; rehabilitate T/W and apron; improve safety areas	415,000
Glasgow*	Rehabilitate 12/30; expand fueling area; construct T/W; install new water main; purchase snow removal equipment	700,000
Columbus	Master Plan underway; develop airport to standards outlined in Master Plan	760,000
Malta	Rehabilitate paved areas; construct T/W; remove obstructions; install glide slope indicators	230,000
Stevensville	Rehabilitate paved areas; install airport lighting and glide slope indicators	230,000
Ekalaka	Conduct site evaluation study and develop airport according to FAA standards in study	720,000
White Sulphur Springs	Rehabilitate paved areas; expand apron; install glide slope indicators; and improve safety areas	340,000
Broadus	Develop airport to FAA standards	720,000
Jordan	Rehabilitate all paved areas and improve safety areas	200,000
Havre	Rehabilitate 7/25, T/W's, and apron	450,000
Wolf Point*	Rehabilitate all paved areas; install perimeter fencing	390,000

* Airport may be eligible for commercial-service funds.

TABLE VIII.1

RECOMMENDED PRIORITIZATION SCHEDULE

Airport	Improvement Description	Estimated Cost
Culbertson	Rehabilitate and widen 7/25; remove obstructions; expand apron; rehabilitate and widen T/W; replace airport lighting and glide slope indicators	$ 500,000
Philipsburg	Rehabilitate and extend 16/34; install glide slope indicators; and improve safety areas	350,000
Gardiner	Develop airport to applicable FAA standards	700,000
Terry	Rehabilitate all paved surfaces; install glide slope indicators	210,000
Fort Benton	Master Plan underway; develop airport to standards outlined in Master Plan	1,135,000
Big Sandy	Rehabilitate 6/24 and relocate threshold; extend T/W and construct apron area; install airport lighting and glide slope indicators; improve drainage and safety areas	400,000
Circle	Rehabilitate all paved areas	200,000
Turner	Rehabilitate all paved areas; improve safety areas	210,000
Plains	Conduct Master Plan and develop airport to FAA standards outlined in Master Plan	700,000
Colstrip	Master Plan underway; develop airport to standards outlined in Master Plan	2,130,000
Drummond	Master Plan underway; develop airport to standards outlined in Master Plan	770,000

* Airport may be eligible for commercial-service funds.

Chapter IX

Plan Implementation

CHAPTER IX: PLAN IMPLEMENTATION

A. FUTURE ROLE OF THE MONTANA AERONAUTICS DIVISION

The Montana Aeronautics Division is the state agency created by the Legislature to protect and promote aviation in Montana.

Title 67 of the Montana Code Annotated defines the powers and duties of the Aeronautics Division. Some of the current duties of the Division include the following:

- Supervise aeronautics in the state
- Encourage and assist in the development of aeronautics
- Encourage the establishment of airports and other navigation facilities
- Further the public's interest in aviation
- Administer and enforce aircraft and pilot registration
- Draft and recommend necessary legislation to advance the interest of the state in aeronautics

The future of general aviation in Montana depends greatly on the strength and effectiveness of the Aeronautics Division and its programs. The Aeronautics Division must provide leadership and direction in the development of Montana's GA airports and the State's navigation, communication, and weather information systems. The Aeronautics Division should take an active role in monitoring and directing the development of our system of GA airports by working cooperatively with the FAA in establishing the priorities of the federally-funded GA airport improvements.

The Aeronautics Division should implement additional programs that will provide adequate financial assistance for improving and maintaining the state's system of airports. The new programs should include financial grants for the following:

- 50% of the local share of all federal AIP programs (grants totaling approximately $450,000 annually)
- 50% of the local share for improvements to the state's non-NPIAS airports (grants totaling $50,000 annually)
- 50% of the local share for GA airport pavement maintenance projects such as crack-sealing, chip-seals, fog seals, and pavement marking (grants totaling $100,000 annually).

One of the most important roles of the Aeronautics Division is to provide technical and financial assistance to local communities in the development of their airport. The grant programs mentioned above are essential to the future of the state's sys-

tem of community airports. The revenue needed to create the proposed grant programs could be generated through a variety of funding mechanisms such as the State General Fund, Coal Trust Fund, Aviation Fuel Tax, State Sales Tax, or Economic Development Funds.

The current aviation assistance programs provided by the Aeronautics Division should be examined and revised as necessary to insure the programs are being operated in the most cost-effective manner possible.

The Montana Aeronautics Division should continually monitor the views and concerns of airport owners and operators and aviation-interest organizations in order to draft and recommend needed legislation reform affecting aviation in Montana.

In the future, the State may play a greater role in the development of aeronautics in Montana; therefore, the Montana Aeronautics Division needs to be a competent and effective organization. The FAA has recently begun a State Block Grant Pilot Program where 3 state agencies will be responsible for administering the FAA program in their state. In Montana the FAA has already transferred some of the federal workload to the State by contracting the Airport 5010 Inspection Program with NASAO, who in turn subcontracted the work to the Aeronautics Division.

The Aeronautics Division should continue to provide direction in the state's aviation through the continuing planning effort. Continuing planning items should include:

- Pavement condition index survey
- Review and update NPIAS
- Develop a 5-year capital improvement program for NPIAS airports
- Conduct a safety and obstruction survey at NPIAS airports
- State weather plan
- Acoustical counting program
- Commercial air service monitoring program

B. MONTANA'S AVIATION ORGANIZATIONS

Aviation-interest groups form the backbone of Montana's aviation industry. These groups provide support for many aspects of aviation. They also provide a forum for discussion of the issues that concern and affect the people and businesses involved in Montana's aviation system.

Montana's aviation organizations are described below:

Montana Pilots Association (MPA): This organization was created in the mid-1940's by Montana pilots to promote aviation. The aviation group currently has approximately 650 members.

Montana Aviation Trades Association (MATA): MATA is an 80-member organization representing the people who provide professional aviation services in Montana. The group was formed in the early 1950's to promote aviation business. MATA represents a wide variety of people including: aerial applicators, fixed-base operators, professional pilots, and people involved in aviation-related businesses.

Montana Airport Management Association (MAMA): The Montana Airport Management Association has approximately 65 members including airport managers, consultants, and concessionaires. The organization is interested in all issues that affect the operation of the state's system of airports.

Montana Flying Farmers (MFF): The Flying Farmers' organization was created to promote those aspects of aviation that benefit Montana's agricultural industry. The group currently has approximately 100 members.

Montana 99's: Amelia Earhart began the 99's in 1928 along with 98 other women pilots in Long Island, New York. Since that time, the organization has grown to 7,200 members nationwide. The Montana Chapter of the 99's started in 1954. It currently has 22 members, all of whom are women pilots. The 99's was organized to support and encourage women pilots and promote aviation in general. The 99's also provide volunteer service to the state's small local airports through its "air marking program", where they apply pavement markings (runway numbers and airport names). The marking paint is provided by the Montana Aeronautics Division.

Montana Antique Aircraft Association (MAAA): This association was established to promote the restoration and operation of vintage aircraft. The group has approximately 150 members statewide and hosts an annual antique aircraft "fly-in" at the Three Forks Airport.

Experimental Aircraft Association (EAA): There are 3 Montana chapters of this national organization with approximately 300 members statewide. The EAA promotes all aspects of development, construction, and operation of experimental and home-built aircraft.

Civil Air Patrol (CAP): The Civil Air Patrol in Montana is an organization of approximately 250 members. The CAP is involved in providing public services through aviation. They play a key role in air search and rescue efforts under the direction of the Montana Aeronautics Division. They are also involved in aviation education programs for the youth of Montana.

Aviation Organizations of Montana (AOM): This organization consists of representatives of each of the 8 aviation organizations listed above. Montana's aviation groups originally came together in 1984 to jointly sponsor the statewide aviation convention. These groups have continued to hold joint annual conventions since that time. In 1987 the Aviation Organizations of Montana became more structured when they began the production of a video tape promoting aviation in Montana.

There are also several national aviation organizations that are active in Montana including:

- Aircraft Owners and Pilots Association (AOPA)
- National Association of State Aviation Officials (NASAO)
- American Association of Airport Executives (AAAE)
- National Air Transportation Association (NATA)
- Air Transportation Association (ATA)

Montana's aviation industry is fragmented and is represented by the various organizations which are interested in different aspects of aviation. Montana's aviation industry should promote a unified stance on aviation issues. The creation of the Aviation Organizations of Montana is a positive step in the right direction. The coordinated support of aviation groups will produce a stronger aviation industry in Montana.

C. REQUIRED LEGISLATIVE CHANGES

Changes to current State legislation are necessary to implement certain aspects of the recommended system plan. The following legislative changes are recommended:

Chapter 1 of Title 67 of the Montana Code Annotated (MCA) defines the function of the Aeronautics Board. These provisions should be revised to establish a board that is authorized to establish policies and review the function of the Aeronautics Division. In this way the Aeronautics Board would be similar to our State Highway Commission, which has been very effective in overseeing the functions of the Department of Highways.

Chapter 1 of Title 67, MCA, describes the financial mechanisms that generate revenue for airports. This chapter should be modified to include the new financial programs that will generate the revenue necessary to operate the Aeronautics Division and the proposed state aviation grant assistance programs.

Chapter 2 of Title 67, MCA, defines the duties of the Montana Aeronautics Division. *It should be revised to include administration of the proposed grant* programs which would provide financial assistance for airport improvements and airport maintenance.

Chapter 6 of Title 67, MCA, is the "Airport Zoning Act". This act describes the zoning rights of local governments in Montana with respect to airports. It should be strengthened by requiring all local governments to create zoning regulations to prevent the creation or establishment of airport hazards.

Appendices

APPENDIX A: EXISTING PUBLIC-USE AIRPORT FACILITIES IN MONTANA

Airports by County	City or Town	Airport Class	Service Level	Airport in NPIAS	No. of Runways	Primary Runway Length (Ft.)	Primary Runway Surface Type	Taxiway Configuration	Runway Lights (Intensity)	Rotating Beacon	Approach Status	Existing T-Hangars (Units)	Conventional Hangar Space (Sq. Ft.)
Beaverhead													
Dell Flight Strip	Dell	BU	GA	No	1	5,000	Paved	Connector	Low	Yes	VFR	3	0
Dillon*	Dillon	GU	GA	Yes	2	5,500	Paved	Connector	Medium	Yes	IFR/C	14	2,700
Wisdom	Wisdom	LU	GA	No	1	3,400	Turf	Other	None	No	VFR	0	0
Big Horn													
Fairgrounds Airpark	Hardin	BU	GA	No	1	3,500	Paved	Other	Low	Yes	VFR	10	3,600
Yellowtail Dam	Fort Smith	BU	GA	No	1	3,827	Paved	Other	None	No	VFR	0	0
Blaine													
Chinook Municipal	Chinook	BU	GA	Yes	1	3,900	Paved	Connector	Low	Yes	VFR	20	11,200
Hogeland	Hogeland	LU	GA	No	2	3,600	Turf	Connector	None	Yes	VFR	1	0
Riggin Memorial	Harlem	BU	GA	Yes	2	4,100	Paved	Connector	Medium	Yes	VFR	6	4,800
Turner	Turner	BU	GA	Yes	2	3,600	Paved	Connector	Low	Yes	VFR		
Broadwater													
Canyon Ferry	Canyon Ferry	LU	GA	No	1	3,200	Turf	Other	None	No	VFR	0	4,000
Townsend	Townsend	BU	GA	Yes	1	4,100	Paved	Other	Low	Yes	VFR	5	0
Carbon													
Bridger Municipal	Bridger	BU-	GA	No	1	3,400	Paved	Connector	Low	Yes	VFR	1	1,936
Red Lodge	Red Lodge	BU-	GA	Yes	2	4,000	Paved	Connector	Medium	Yes	VFR	8	4,200
Carter													
Ekalaka	Ekalaka	LU	GA	No	1	2,950	Turf	Other	Low	Yes	VFR	0	5,760
Cascade													
Great Falls Int'l.	Great Falls	T	PR	Yes	3	10,502	Paved	Parallel	High	Yes	IFR/P	0	80,726
Chouteau													
Big Sandy	Big Sandy	BU	GA	Yes	2	3,200	Paved	Connector	Low	Yes	VFR	9	5,000
Fort Benton	Fort Benton	BU	GA	Yes	1	3,400	Paved	Partial Parallel	Medium	Yes	VFR	3	14,520
Geraldine	Geraldine	BU-	GA	No	1	2,900	Paved	Connector	Low	Yes	VFR	7	0
Custer													
Frank Wiley Field	Miles City	T	GA	Yes	2	6,310	Paved	Connectors	Medium	Yes	IFR/NPI	22	27,800
Daniels													
East Poplar Int'l.	East Poplar	LU	GA	No	1	3,300	Turf	Other	None	No	VFR	0	0
Scobey	Scobey	BU	GA	Yes	1	4,000	Paved	Partial Parallel	Medium	Yes	VFR	10	9,600
Dawson													
Dawson Community	Glendive	T	GA	Yes	2	5,704	Paved	Connector	Medium	Yes	IFR/NPI	21	13,350
Richey	Richey	LU	GA	No	1	2,694	Turf	Other	Low	Yes	VFR	2	0
Deer Lodge													
Anaconda	Anaconda	BU	GA	Yes	2	4,500	Paved	Connector	Medium	Yes	VFR	7	4,400
Fallon													
Baker Municipal	Baker	GU	GA	Yes	2	4,800	Paved	Connector	Low	Yes	VFR	14	11,250
Fergus													
Denton	Denton	LU	GA	No	1	2,500	Turf	Other	None	No	VFR	0	0
Lewistown	Lewistown	GU	GA	Yes	3	5,800	Paved	Connector	Medium	Yes	IFR/NPI	28	30,600
Winifred	Winifred	LU	GA	Yes	1	2,350	Turf	Other	None	No	VFR	1	3,000
Flathead													
Ferndale Airfield	Bigfork	LU	GA	No	1	3,500	Turf	Other	None	No	VFR	20	5,200
Glacier Park Int'l.	Kalispell	T	PR	Yes	2	8,000	Paved	Parallel	High	Yes	IFR/P	17	22,500
Kalispell City	Kalispell	BU	GA	No	1	3,600	Paved	Parallel	Low	Yes	VFR	16	31,450
Meadow Creek (USFS)	Meadow Creek	LU	GA	No	1	3,000	Turf	Other	None	No	VFR	0	0
Schafer (USFS)	Ranger Station	LU	GA	No	1	3,300	Turf	Other	None	No	VFR	0	0
Spotted Bear (USFS)	Ranger Station	LU	GA	No	1	3,800	Turf	Other	None	No	VFR	0	0
Whitefish	Whitefish	LU	GA	No	1	3,150	Turf	Connector	None	No	VFR	0	0

*Airport currently under construction, expanded facilities shown.

APPENDIX A: EXISTING PUBLIC-USE AIRPORT FACILITIES IN MONTANA

Airports by County	City or Town	Airport Class	Service Level	Airport in NPIAS	No. of Runways	Primary Runway Length (Ft.)	Primary Runway Surface Type	Taximay Configuration	Runway Lights (Intensity)	Rotating Beacon	Approach Status	Existing T-Hangars (Units)	Conventional Hangar Space (Sq. Ft.)
Gallatin													
Gallatin Field	Bozeman	T	PR	Yes	2	9,002	Paved	Parallel	Medium	Yes	IFR/P	40	44,900
Three Forks	Three Forks	BU	GA	Yes	2	4,100	Paved	Connector	Medium	Yes	VFR	5	4,608
Yellowstone	West Yellowstone	T	CS	Yes	1	8,400	Paved	Parallel	High	Yes	IFR/P	0	0
Garfield													
Jordan	Jordan	BU	GA	Yes	1	4,300	Paved	Connector	Medium	Yes	VFR	2	0
Glacier													
Babb	Babb	LU	GA	No	1	3,860	Turf	Other	None	No	VFR	0	0
Cut Bank Municipal	Cut Bank	GU	GA	Yes	3	5,985	Paved	Connector	Medium	Yes	IFR/NPI	14	25,300
Starr-Browning	Browning	BU	GA	No	1	4,033	Paved	Other	None	No	VFR	0	0
Whetstone Int'l.	Del-Bonita	LU	GA	No	1	4,200	Turf	Other	None	No	VFR	0	0
Golden Valley													
Lavina	Lavina	LU	GA	No	1	3,500	Turf	Other	None	No	VFR	0	0
Ryegate	Ryegate	LU	GA	No	1	3,440	Turf	Other	None	Yes	VFR	0	0
Granite													
Drummond	Drummond	LU	GA	No	1	2,400	Turf	Other	Low	Yes	VFR	2	0
Riddick Field	Philipsburg	BU-	GA	Yes	1	3,600	Paved	Connector	Medium	Yes	VFR	9	0
Hill													
Havre City-County	Havre	T	GA	Yes	2	5,200	Paved	Partial Parallel	Medium	Yes	IFR/NPI	24	28,100
Jefferson													
Boulder	Boulder	LU	GA	No	1	3,650	Turf	Other	None	No	VFR	0	0
Judith Basin													
Stanford	Stanford	BU	GA	Yes	2	4,200	Paved	Connector	Medium	Yes	VFR	3	4,800
Lake													
Polson	Polson	BU	GA	Yes	1	4,200	Paved	Connector	Medium	Yes	VFR	6	9,300
Ronan	Ronan	LU	GA	Yes	1	3,004	Stabilized	Connector	Low	Yes	VFR	4	0
St. Ignatius	St. Ignatius	BU-	GA	No	1	2,510	Paved	Connector	Low	Yes	VFR	1	3,000
Lewis & Clark													
Augusta	Augusta	LU	GA	No	1	3,680	Turf	Other	None	No	VFR	0	0
Benchmark (USFS)	Augusta (30 mi.)	BU	GA	Yes	1	6,000	Paved	Connector	None	No	VFR	0	0
Helena Regional	Helena	T	PR	Yes	3	9,000	Paved	Parallel	High	Yes	IFR/P	53	28,737
Lincoln	Lincoln	BU-	GA	Yes	1	4,000	Paved	Connector	None	Yes	VFR	0	6,000
Oxbow Ranch	Wolf Creek	LU	GA	No	1	4,800	Turf	Other	None	No	VFR	1	0
Liberty													
Liberty County	Chester	BU	GA	Yes	2	4,600	Paved	Connector	Medium	Yes	VFR	7	12,800
Tiber Dam	SW of Chester	LU	GA	No	1	2,600	Turf	Other	None	No	VFR	0	0
Lincoln													
Eureka	Eureka	BU	GA	Yes	1	4,200	Paved	Parallel	Low	Yes	VFR	9	4,096
Libby	Libby	GU	GA	Yes	1	5,000	Paved	Partial Parallel	Medium	Yes	VFR	1	0
Troy (USFS)	Troy	BU	GA	No	1	3,930	Paved	Other	None	No	VFR	1	0
Madison													
Big Sky Airpark	Ennis	LU	GA	No	1	5,280	Turf	Other	Low	Yes	VFR	7	6,400
Twin Bridges	Twin Bridges	LU	GA	Yes	2	3,810	Turf	Connector	None	No	VFR	0	
McCone													
Circle Town-County	Circle	BU	GA	Yes	2	4,100	Paved	Connector	Medium	Yes	VFR	7	5,400
Meagher													
White Sulphur Springs	White Sulphur Springs	BU	GA	Yes	2	4,600	Paved	Connector	Medium	Yes	VFR	0	2,025

APPENDIX A: EXISTING PUBLIC-USE AIRPORT FACILITIES IN MONTANA

Airports by County	City or Town	Airport Class	Service Level	Airport in NPIAS	No. of Runways	Primary Runway Length (Ft.)	Primary Runway Surface Type	Taxiway Configuration	Runway Lights (Intensity)	Rotating Beacon	Approach Status	Existing T-Hangars (Units)	Conventional Hangar Space (Sq. Ft.)
Mineral													
Mineral County	Superior	BU	GA	Yes	1	3,400	Paved	Other	Low	Yes	VFR	2	7,000
Missoula													
Condon (USFS)	Condon	LU	GA	No	1	3,035	Turf	Other	None	No	VFR	0	0
Rock Creek - Elliot	Clinton	LU	GA	No	1	3,800	Turf	Other	None	No	VFR	1	0
Johnson-Bell Field	Missoula	T	PR	Yes	2	9,499	Paved	Partial Parallel	High	Yes	IFR/P	37	18,240
Seeley Lake	Seeley Lake	LU	GA	No	1	3,500	Turf	Other	None	No	VFR	1	0
Musselshell													
Roundup	Roundup	CU	GA	Yes	2	5,100	Paved	Connector	Medium	Yes	VFR	5	5,000
Park													
Gardiner	Gardiner	LU	GA	Yes	1	3,400	Stabilized	Other	Low	No	VFR	6	2,720
Mission Field	Livingston	BU	GA	Yes	3	5,700	Paved	Connector	Medium	Yes	IFR/C	17	10,000
Wilsall	Wilsall	LU	GA	No	1	3,100	Turf	Other	None	No	VFR	0	0
Phillips													
Malta	Malta	BU	GA	Yes	2	3,600	Paved	Connector	Medium	Yes	VFR	8	11,300
Morgan (Border)	Morgan	LU	GA	No	1	3,050	Turf	Connector	None	No	VFR	0	0
Pondera													
Conrad	Conrad	BU	GA	Yes	2	4,600	Paved	Connector	Medium	Yes	IFR/NPI	8	6,500
Valier	Valier	LU	GA	Yes	3	3,000	Turf	Other	None	No	VFR	3	2,000
Powder River													
Belle Creek	Belle Creek	BU	GA	No	1	3,800	Paved	Connector	Low	Yes	VFR	3	0
Broadus	Broadus	BU-	GA	Yes	1	3,150	Paved	Connector	Low	Yes	VFR	1	6,100
Powell													
Deer Lodge	Deer Lodge	BU	GA	Yes	2	4,400	Paved	Connector	Medium	Yes	VFR	5	2,160
Prairie													
Terry	Terry	CU	GA	Yes	1	4,300	Paved	Connector	Medium	Yes	VFR	3	0
Ravalli													
Hamilton	Hamilton	BU	GA	Yes	1	4,200	Paved	Parallel	Medium	Yes	VFR	4	101,900
Stevensville	Stevensville	BU	GA	Yes	1	3,800	Paved	Connector	None	No	VFR	17	0
Richland													
Fairview	Fairview	LU	GA	No	1	3,000	Turf	Connector	None	No	VFR	1	0
Sidney-Richland Municipal	Sidney	T	GA	Yes	2	5,705	Paved	Connector	Medium	Yes	IFR/NPI	23	29,800
Roosevelt													
Big Sky Field	Culbertson	BU	GA	Yes	1	3,000	Paved	Connector	Medium	Yes	VFR	5	4,400
Poplar	Poplar	BU	GA	Yes	1	3,000	Paved	Connector	Medium	Yes	VFR	0	9,600
Wolf Point Int'l.	Wolf Point	T	GA	Yes	1	5,089	Paved	Partial Parallel	Medium	Yes	IFR/NPI	1	20,200
Rosebud													
St. Labre Mission	Ashland	LU	GA	No	1	3,575	Gravel	Connector	None	No	VFR	0	0
Tillitt Field	Forsyth	CU	GA	Yes	1	4,800	Paved	Connector	Medium	Yes	IFR/NPI	15	7,000
Sanders													
Hot Springs	Hot Springs	LU	GA	No	1	2,500	Stabilized	Connector	Medium	Yes	VFR	1	0
Plains	Plains	LU	GA	Yes	2	3,050	Turf	Connector	Medium	Yes	VFR	6	0
Thompson Falls	Thompson Falls	BU	GA	Yes	1	4,200	Paved	Partial Parallel	Medium	Yes	VFR	0	6,500
Sheridan													
Sher-Wood	Plentywood	BU	GA	Yes	4	3,900	Paved	Connector	Medium	Yes	VFR	7	26,800

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Airports by County	City or Town	Airport Class	Service Level	Airport in NPIAS	No. of Runways	Primary Runway Length (Ft.)	Primary Runway Surface Type	Taxiway Configuration	Runway Lights (Intensity)	Rotating Beacon	Approach Status	Existing T-Hangars (Units)	Conventional Hangar Space (Sq. Ft.)
Silver Bow													
Bert Mooney	Butte	T	CS	Yes	2	9,000	Paved	Parallel	Medium	Yes	IFR/P	12	19,400
Stillwater													
Columbus	Columbus	BU-	GA	Yes	1	2,625	Paved	Connector	Low	Yes	VFR	11	8,175
Sweet Grass													
Big Timber	Big Timber	BU	GA	Yes	2	4,650	Paved	Connector	Medium	Yes	VFR	7	7,300
Teton													
Choteau	Choteau	BU	GA	Yes	2	3,800	Paved	Connector	Medium	Yes	IFR/NPI	15	3,100
Outton	Outton	LU	GA	No	1	2,780	Turf	Other	Low	Yes	VFR	0	3,000
Fairfield	Fairfield	LU	GA	No	2	3,900	Turf	Other	Low	Yes	VFR	0	3,000
Toole													
Ross Int'l.	Sweetgrass	LU	GA	No	1	3,000	Turf	Other	None	No	VFR	0	0
Shelby	Shelby	BU	GA	Yes	2	4,600	Paved	Partial Parallel	Medium	Yes	IFR/NPI	14	9,600
Sunburst	Sunburst	LU	GA	No	1	2,650	Turf	Other	None	No	VFR	1	0
Treasure													
Hysham	Hysham	LU	GA	No	1	2,950	Gravel	Connector	Low	Yes	VFR	3	0
Valley													
Glasgow Int'l.	Glasgow	T	GA	Yes	2	5,006	Paved	Connector	Medium	Yes	IFR/NPI	24	20,580
Hinsdale	Hinsdale	LU	GA	No	3	2,300	Turf	Other	None	No	VFR	0	3,000
Nashua	Nashua	LU	GA	No	1	2,921	Turf	Other	None	No	VFR	0	0
Opheim	Opheim	LU	GA	No	3	2,700	Turf	Other	Low	Yes	VFR	2	0
Valley Industrial Park	Glasgow	T	GA	No	1	13,500	Paved	Parallel	High	Yes	VFR	0	100,000
Wheatland													
Harlowton	Harlowton	BU	GA	Yes	2	4,200	Paved	Connector	Medium	Yes	VFR	4	2,400
Yellowstone													
Billings-Logan Int'l.	Billings	T	PR	Yes	4	10,528	Paved	Parallel	High	Yes	IFR/P	66	151,223
Laurel Municipal	Laurel	BU	GA	Yes	2	3,725	Paved	Connector	Medium	Yes	IFR/NPI	26	32,600

AIRPORT CLASS DEFINITIONS

T = Transport Category (Paved)
GU = General Utility (Paved)
BU = Basic Utility (Paved)
BU- = Less than Basic Utility (Paved)
LU = Less than Basic Utility (Unpaved)

SERVICE LEVEL DEFINITIONS

PR = Primary Airport
CS = Commercial Service Airport
GA = General Aviation Airport

TAXIWAY CONFIGURATION DEFINITIONS

Parallel = Taxiway paralleling entire runway.
Partial Parallel = Taxiway paralleling portion of runway.
Connector = Direct connection between runways and apron.
Other = Apron connected directly to runway; no discernible connection, etc.

APPROACH STATUS DEFINITIONS

IFR/P = Instrument Flight Rules/Precision Instrument Approach
IFR/NPI = Instrument Flight Rules/Non-Precision Instrument Approach
IFR/C = Instrument Flight Rules/Circling Approach Only.
VFR = Visual Flight Rules

APPENDIX B: EXISTING GA AIRPORT OPERATIONS AND BASED AIRCRAFT IN MONTANA

Airports by County	City or Town	1987 Based Aircraft	1987 GA Operations Calculated	5010-1	Preferred Value	FAA Air Traffic Activity - FY 1986	Master Plans
Beaverhead							
Dell Flight Strip	Dell	2	1,350	800	1,350		
Dillon	Dillon	12	3,950	8,000	3,950		
Wisdom	Wisdom	0	1,000	60	60		
Big Horn							
Fairgrounds Airpark	Hardin	14	5,050	7,000	5,050		
Yellowtail Dam	Fort Smith	0	1,000	350	350		
Blaine							
Chinook Municipal	Chinook	29	7,525	15,000	7,525		
Hogeland	Hogeland	2	1,350	400	400		
Riggin Memorial	Harlem	11	2,925	2,400	2,925		
Turner	Turner	8	2,750	4,000	2,750		
Broadwater							
Canyon Ferry	Canyon Ferry	0	1,000	350	350		
Townsend	Townsend	11	3,275	2,400	3,275		
Carbon							
Bridger Municipal	Bridger	2	1,700	500	1,700		
Red Lodge	Red Lodge	10	3,050	9,400	3,050		
Carter							
Ekalaka	Ekalaka	6	2,550	1,400	2,550		
Cascade							
Great Falls Int'l.	Great Falls	110	25,800	31,392	33,541	33,541	38,401(FY85)
Chouteau							
Big Sandy	Big Sandy	16	4,700	4,800	4,700		
Fort Benton	Fort Benton	18	4,650	12,000	4,650		
Geraldine	Geraldine	8	3,800	4,000	3,800		
Custer							
Frank Wiley Field	Miles City	35	9,175	25,000	9,175		
Daniels							
East Poplar Int'l.	East Poplar	0	1,000	(est.)200	200		
Scobey	Scobey	14	3,950	9,800	3,950		
Dawson							
Dawson Community	Glendive	29	7,825	13,117	7,825		
Richey	Richey	5	1,225	3,200	1,225		
Deer Lodge							
Anaconda	Anaconda	10	3,050	5,000	3,050		
Fallon							
Baker Municipal	Baker	27	6,425	11,000	6,425		8,000 (FY86)
Fergus							
Denton	Denton	0	1,000	250	250		
Lewistown	Lewistown	25	7,175	20,000	7,175		
Winifred	Winifred	3	1,525	700	700		
Flathead							
Ferndale Airpark	Bigfork	31	7,175	12,000	7,175		
Glacier Park Int'l.	Kalispell	50	11,250	54,500	54,500		
Kalispell City	Kalispell	59	12,825	23,000	12,825		
Meadow Creek (USFS)	Meadow Creek	0	1,000	125	125		
Schafer (USFS)	Ranger Station	0	1,000	175	175		
Spotted Bear (USFS)	Ranger Station	0	1,000	150	150		
Whitefish	Whitefish	0	1,000	500	500		

APPENDIX B: EXISTING GA AIRPORT OPERATIONS AND BASED AIRCRAFT IN MONTANA

Airports by County	City or Town	1987 Based Aircraft	1987 GA Operations			FAA Air Traffic Activity - FY 86	Master Plans
			Calculated	5010-1	Preferred Value		
Gallatin							
Gallatin Field	Bozeman	115	24,075	30,600	30,600		53,045 (FY85)
Three Forks	Three Forks	17	4,125	6,100	4,125		
Yellowstone	West Yellowstone	3	1,675	4,500	1,675		
Garfield							
Jordan	Jordan	2	2,000	3,000	2,000		
Glacier							
Babb	Babb	0	1,000	300	300		
Cut Bank Municipal	Cut Bank	30	7,550	4,500	7,500		
Starr-Browning	Browning	0	1,000	400	400		
Whetstone Int'l.	Oel-Bonita	0	1,000	(est.)200	200		
Golden Valley							
Lavina	Lavina	0	1,000	120	120		
Ryegate	Ryegate	0	1,000	150	150		
Granite							
Drummond	Drummond	1	1,175	150	150		
Riddick Field	Philipsburg	7	2,225	2,400	2,225		
Hill							
Havre City-County	Havre	54	12,100	26,000	12,100		
Jefferson							
Boulder	Boulder	2	1,650	650	1,650		
Judith Basin							
Stanford	Stanford	8	2,750	3,250	2,750		
Lake							
Polson	Polson	17	5,125	14,500	5,125		
Ronan	Ronan	8	2,900	2,850	2,900		
St. Ignatius	St. Ignatius	3	1,675	3,000	1,675		
Lewis & Clark							
Augusta	Augusta	0	1,000	200	200		
Benchmark (USFS)	Augusta (30 mi.)	0	1,000	200	200		
Helena Regional	Helena	158	33,800	33,004	33,800	34,149	
Lincoln	Lincoln	4	2,000	6,200	2,000		
Oxbow Ranch	Wolf Creek	0	1,000	150	150		
Liberty							
Liberty County	Chester	18	5,250	4,200	5,250		
Tiber Dam		0	1,000	(est.)200	200		
Lincoln							
Eureka	Eureka	10	2,750	2,500	2,750		
Libby	Libby	17	4,125	10,000	4,125		
Troy (USFS)	Troy	1	1,175	500	500		
Madison							
Big Sky Airpark	Ennis	13	3,575	1,300	3,575		
Twin Bridges	Twin Bridges	5	1,875	1,600	1,875		
McCone							
Circle Town-County	Circle	10	3,330	2,500	3,300		
Meagher							
White Sulphur Springs	White Sulphur Springs	5	2,025	5,500	2,025		
Mineral							
Mineral County	Superior	11	3,275	1,400	3,275		

APPENDIX B: EXISTING GA AIRPORT OPERATIONS AND BASED AIRCRAFT IN MONTANA

Airports by County	City or Town	1987 Based Aircraft	Current GA Operations			FAA Air Traffic Activity - FY 1986	Master Plans
			Calculated	5010-1	Preferred Value		
Missoula							
Condon (USFS)	Condon	0	1,000	250	250		
Rock Creek-Elliot	Clinton	1	1,175	250	250		
Johnson-Bell Field	Missoula	134	28,350	55,648	42,401	42,401	52,910 (FY85)
Seeley Lake	Seeley Lake	2	1,350	1,060	1,350		
Musselshell							
Roundup	Roundup	10	3,550	6,000	3,550		
Park							
Gardiner	Gardiner	13	3,425	5,300	3,425		
Mission Field	Livingston	19	5,125	8,500	5,125		
Wilsall	Wilsall	1	1,175	275	275		
Phillips							
Malta	Malta	24	6,650	7,500	6,650		
Morgan (Border)	Morgan	0	1,000	(est.)200	200		
Pondera							
Conrad	Conrad	15	4,175	7,000	4,175		
Valier	Valier	8	2,800	2,400	2,800		
Powder River							
Belle Creek	Belle Creek	4	1,700	700	700		
Broadus	Broadus	3	1,875	2,350	1,875		
Powell							
Deer Lodge	Deer Lodge	11	2,925	2,200	2,925		
Prairie							
Terry	Terry	4	1,850	800	1,850		
Ravalli							
Hamilton	Hamilton	50	10,550	21,126	10,550		
Stevensville	Stevensville	20	4,950	4,600	4,950		
Richland							
Fairview	Fairview	1	1,525	600	600		
Sidney-Richland Municipal	Sidney	61	13,175	19,500	13,175		
Roosevelt							
Big Sky Field	Culbertson	12	3,850	5,700	3,850		
Poplar	Poplar	7	2,875	5,200	2,875		
Wolf Point Int'l.	Wolf Point	24	7,000	10,250	7,000		
Rosebud							
St. Labre Mission	Ashland	0	1,000	450	450		
Tillitt Field	Forsythe	23	5,625	11,000	5,625		
Sanders							
Hot Springs	Hot Springs	0	1,000	400	400		
Plains	Plains	5	2,025	1,700	2,025		
Thompson Falls	Thompson Falls	3	1,525	2,250	1,525		
Sheridan							
Sher-Wood	Plentywood	26	6,660	14,420	6,600		
Silver Bow							
Bert Mooney	Butte	54	12,750	10,706	12,750		
Stillwater							
Columbus	Columbus	20	4,800	7,000	4,800		

APPENDIX B: EXISTING GA AIRPORT OPERATIONS AND BASED AIRCRAFT IN MONTANA

Airports by County	City or Town	1987 Based Aircraft	1987 GA Operations Calculated	5010-1	Preferred Value	FAA Air Traffic Activity - FY 86	Master Plans
Sweet Grass							
Big Timber	Big Timber	11	3,425	7,400	3,425		
Teton							
Choteau	Choteau	8	2,800	7,200	2,800		
Outton	Outton	7	3,125	1,300	3,125		
Fairfield	Fairfield	8	2,750	3,000	2,750		
Toole							
Ross Int'l.	Sweetgrass	0	1,000	(est.)200	200		
Shelby	Shelby	21	5,975	4,500	5,975		
Sunburst	Sunburst	0	1,000	(est.)200	200		
Treasure							
Hysham	Hysham	3	1,525	400	400		
Valley							
Glasgow Int'l.	Glasgow	33	8,925	33,800	8,925		
Hinsdale	Hinsdale	3	1,675	600	600		
Opheim	Opheim	1	1,375	300	300		
Valley Industrial Park	Glasgow	0	1,000	-	1,000		
Wheatland							
Harlowton	Harlowton	8	2,400	3,600	2,400		
Yellowstone							
Billings-Logan Int'l.	Billings	249	58,275	79,447	69,261	69,261	94,649(FY83)
Laurel Municipal	Laurel	61	12,025	11,000	12,025		
State of Montana - Total:		2,034					

APPENDIX C
INDIVIDUAL AIRPORT REQUIREMENTS
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City: **ANACONDA**

Airport Name: **ANACONDA**

County: Deer Lodge

Elev: 5,030′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	10	12
Multi Engine:	0	0

Operations: 3,050 3,660

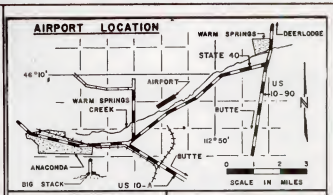
Runway Data: 4/22, 4,500′x60′, paved (good), MIRL

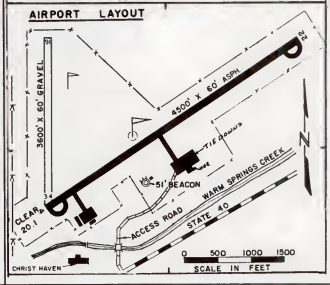
16/34, 3,600′x60′, gravel (good)

Taxiway Data: 108′x25′, paved (good)

Apron Data: 206′x400′, paved (good), 9 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1989

Pave and extend 16/34; construct connecting taxiway and install MIRL, glide slope indicators, and perimeter fencing. — $750,000*

1995

Rehabilitate 4/22, taxiway and apron areas. — $165,000*

2000

Rehabilitate 16/34 and connecting taxiway. — $180,000*

2005

Rehabilitate 4/22, taxiway, and apron. — $165,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **ASHLAND**

Airport Name: **ST. LABRE MISSION**

County: Rosebud

Elev: 2,909′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

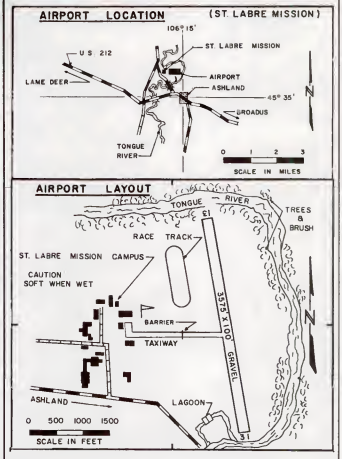
Operations: 450 540

Runway Data: 13/31, 3,575′x100′, gravel (fair)

Taxiway Data: 500′x75′, gravel (good)

Apron Data: 50′x50′, gravel (good)

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

This low-activity airport cannot be improved to meet BUI length requirements. Relocation of the airport is not justified at this time. The airport should be improved by installing a perimeter fence, trimming the brush back from the edges of the runway, and cutting the trees that penetrate the 20:1 approach surfaces.

The airport should be maintained and operated as a VFR-daylight use only facility.

COSTS

$20,000

City: **AUGUSTA**

Airport Name: **AUGUSTA**

County: Lewis & Clark

Elev: 4,145′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

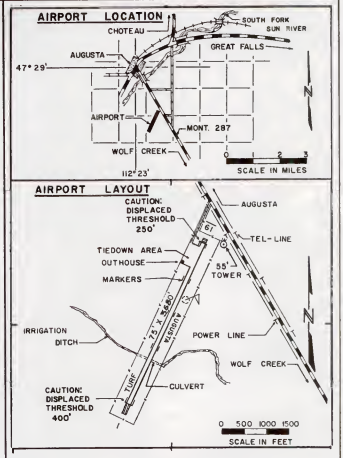
Operations: 200 240

Runway Data: 1/19, 4,300′x75′, turf (good 5010)

Taxiway Data: Turf

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

The beacon tower should be removed.

The power line off the 19 end of the runway should be placed underground, and the fence on the 01 end should be removed to allow for 20:1 approaches and eliminate the need for displaced thresholds.

The facility should be operated and maintained as a VFR-daylight use only airport.

COSTS

$10,000

City: **BABB**

Airport Name: **BABB**

County: Glacier

Elev: 4,518′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

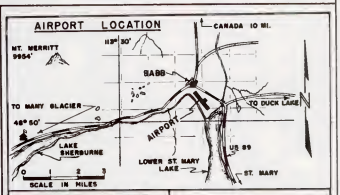
Operations: 300 360

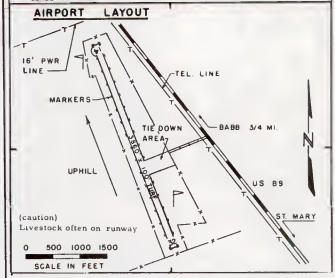
Runway Data: 14/32, 3,860′x100′, turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

1989

This airport is currently operated by the Montana Aeronautics Division. The State should transfer rights and responsibilities to the Blackfoot Tribal Council or Glacier County.

If operation of the airport is not transferred, the State should evaluate the benefits and all associated operating costs to determine if the facility is to remain open.

If the airport is to remain open, all trees that penetrate the 20:1 approach surfaces should be removed.

$2,000

City: **BAKER**

Airport Name: **BAKER MUNICIPAL**

County: Fallon

Elev: 2,971′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	24	32
Multi Engine:	3	6

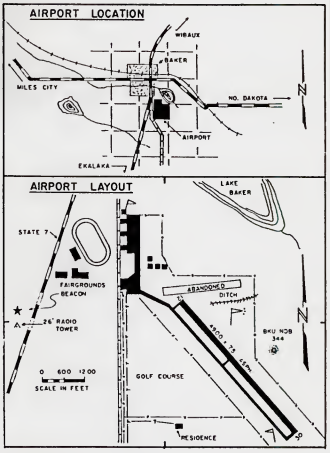
Operations: 6,425 7,710

Runway Data: 12/30, 4,900′x75′, paved (very good), MIRL, PAPI on both ends

Taxiway Data: Partial parallel, 4,900′x35′ paved (very good)

Apron Data: 12,000 sy, paved (very good), 25 tie-downs

Beacon: Yes Nav. Aids: NDB 344



RECOMMENDED IMPROVEMENTS

COSTS

1988

A major reconstruction project is scheduled for 1988 (Note: Airport data reflects these improvements.) The project includes:

- o Acquire clear zone
- o Construct new runway (4,900′x75′)
- o Rehabilitate and extend existing runway for use as parallel taxiway
- o Construct connecting taxiways
- o Expand and pave apron area
- o MIRL
- o Taxiway reflectors
- o Beacon
- o Lighted wind cone
- o Glide slope indicators (both ends)
- o Close Runway 7/25
- o Relocate NDB

Application should be made for a non-precision approach to 30.

$1,577,000*

1998

All paved areas should be rehabilitated.

$ 330,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
2008	
All paved areas should be rehabilitated.	$ 330,000*
NOTE: The runway may require 30,000 lb. strength by this time if heavier aircraft operations are anticipated.	
*Project may be eligible for FAA matching funds.	

City: **BELLE CREEK**

Airport Name: **BELLE CREEK**

County: Powder River

Elev: 3,678′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	4	5
Multi Engine:	0	0

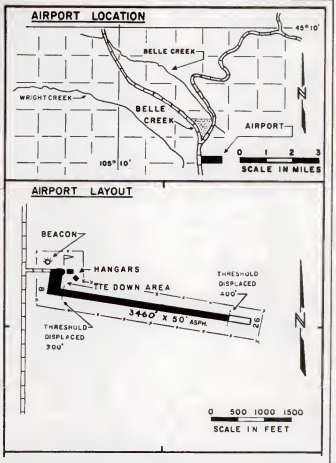
Operations: 700 840

Runway Data: 8/26, 3,460′x50′, paved (good), LIRL

Taxiway Data: None

Apron Data: 100′x150′, paved, 2 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed before 1979.

1989

All paved areas should be rehabilitated. $100,000

1999

All paved areas should be rehabilitated. $100,000

COSTS

City: **BENCHMARK**

Airport Name: **BENCHMARK (USFS)**

County: Lewis & Clark

Elev: 5,434′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

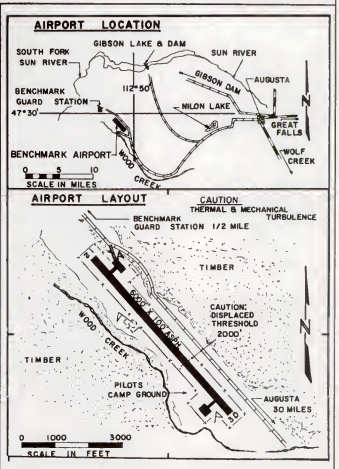
Operations: 200 240

Runway Data: 12/30, 6,000′x100′, paved (fair)

Taxiway Data: 150′x30′, paved (fair)

Apron Data: 100′x100′, paved (fair)

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was in 1968.

1989

The existing facility should be maintained as a VFR-daylight use only airport.

All paved areas should be rehabilitated. $315,000

1999

All paved areas should be rehabilitated. $315,000

COSTS

City: **BIG FORK**

Airport Name: **FERNDALE**

County: Flathead

Elev: 3,060′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	25	30
Multi Engine:	2	2
Turbojet:	1	1
Rotocraft:	3	3
Other:		1

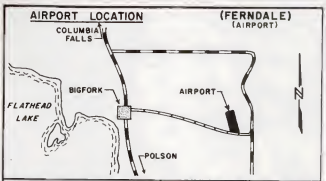
Operations: 7,175 8,610

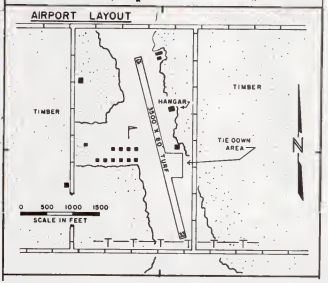
Runway Data: 15/33, 3,500′x80′, turf (good)

Taxiway Data: Turf

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

1989

This airport should be considered for inclusion in the NPIAS. All trees and power lines that penetrate the Part 77 airspace should be removed.

Evaluate the possibility of constructing a paved, BUI length runway with a MIRL system and approach glide slope indicators along with a paved taxiway (300′x25′), apron area (10,000 sy), and airport lighting system.

$741,000

1999

If paved, all paved areas should be rehabilitated.

$150,000

City: **BIG SANDY**

Airport Name: **BIG SANDY**

County: Chouteau

Elev: 2,700′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	15	18
Multi Engine:	1	1

Operations: 4,700 5,640

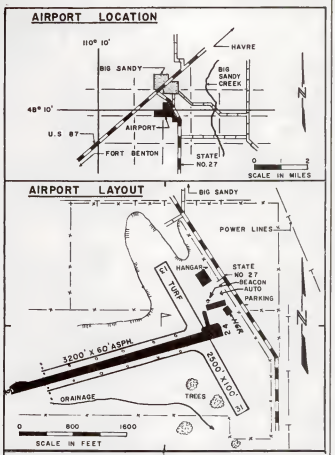
Runway Data: 6/24, 3,200′x60′, paved (very good), LIRL

13/31, 2,500′x100′, turf (fair)

Taxiway Data: 550′x30′, paved (very good)

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1986.

1994

Rehabilitate 6/24 and relocate threshold; extend taxiway and construct apron area; install airport lighting and glide slope indicators; improve drainage and safety areas.

2004

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$400,000*

$147,000*

City: **BIG TIMBER**

Airport Name: **BIG TIMBER**

County: Sweet Grass

Elev: 4,482′

NPIAS: Yes

Based Aircraft:

	1987	2005
Single Engine:	11	13
Multi Engine:	0	0

Operations: 3,425 4,110

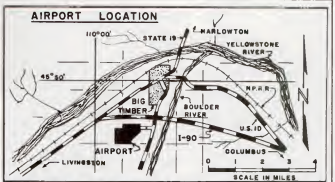
Runway Data: 6/24, 4,650′x75′, paved (good), MIRL

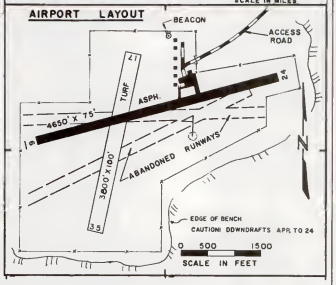
17/35, 3,800′x100′, turf (poor)

Taxiway Data: 150′x30′, paved (good)

Apron Data: 150′150′, paved (good), 5 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1984.

1994

The airport should have a glide slope indicator installed on 24.

All paved areas should be rehabilitated. $204,000*

2004

All paved areas should be rehabiliated. $194,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **BILLINGS**

Airport Name: **BILLINGS-LOGAN INT'L**

County: Yellowstone

Elev: 3,649'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	192	231
Multi Engine:	55	61
Turbojet:	1	1
Rotocraft:	1	1

Operations: 115,171 198,500

Runway Data: 9L/27R, 10,528'x150', paved (very good), HIRL, VASI on 27R, MALSR on 9L

9R/27L, 3,800'x75', paved (fair), MIRL

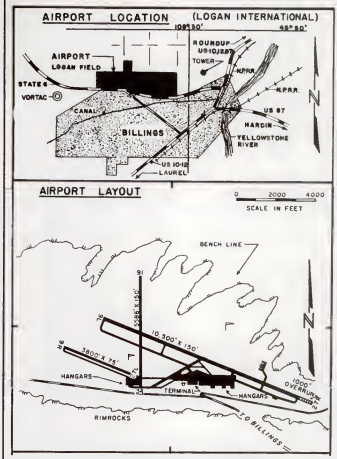
16/34, 5,585'x150', paved (fair), MIRL

Taxiway Data: 148,367 sy, paved (very good), MITL

Apron Data: 100,000 sy GA, paved (good), 57,725 sy airline, paved (good), 180 tie-downs

Beacon: Yes

Nav. Aids: TRSA Stage III Control Tower; VOR 114.5; NDB 400



RECOMMENDED IMPROVEMENTS

Ouring the summer of 1988, a new runway will be constructed for general aviation operations in the northeast-southwest alignment.

The following recommended improvements were taken from the Airport Master Plan:

Phase I (Present - 1990)

1. Acquire (1) approximately 22 acres of private land in the approaches to runway 9L/27R--182 acres to the northwest and 40 acres to the southeast, (2) approximately 35 acres of private land to the northeast of the airport for clear zone and noise compatibility purposes, and (3) approximately 22 acres to the north for noise compatibility purposes. — $ 2,605,000*

2. Acquire approximately 23 acres of private land to the south of the airport for noise compatibility purposes. — 200,000*

3. Grade the hill in the 180-acre acquired land to the northwest in the approach to runway 9L/27R to meet FAA obstruction criteria. — 1,800,000*

COSTS

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
4. Construct a new 5,600'x75' runway 6/24 and parallel 40' wide taxiway for use by general aviation aircraft up to 12,500 pounds and install MIRL and taxiway lights.	6,010,000*
5. Construct a new 900'x400' taxiway for use by general aviation aircraft up to 12,500 pounds to connect the northeastern end of runway 6/24 with the extension of taxiway A east and install taxiway lights.	110,000*
6. Relocate Girl Scouts of America camp about 1,500' to the north.	30,000*
7. Install about 19,900 linear feet of security fence (some of which will be existing relocated fencing) to secure the initially acquired properties.	335,000*
8. Prepared detailed design of terminal complex and passenger terminal building.	100,000
9. Construct new automobile parking areas in the terminal complex to accommodate about 1,150 cars total (about 250 new spaces) in a surface lot for public, rental car, and terminal complex employee parking, and provide lighting, fencing, and associated access and circulation roadways.	213,000
10. Redesign the airport entrance intersection of North 27th Street, State Highway 3, and State Secondary Road 318 to provide for grade-separated access to the airport.	50,000
11. Redevelop existing t-hangar area at the eastern end of the airport to an area south of runway 9R/27L.	2,723,000*
12. Expand water and natural gas utility lines to accommodate new development in areas south of runway 9R/27L.	1,257,000*
Total Phase I Project Costs:	$15,433,000
Phase II (1991 - 1995):	
13. Decommission runway 4/22; mark runway to indicate closed portions and those portions to be used as a taxiway; and relocate lights.	$ 36,000*
14. Decommission runway 16/34; mark runway to indicate closed portions and those portions to be used as a taxiway; relocate lights; and remove pavement as necessary.	136,000*
15. Relocate crash/fire/rescue and airport maintenance facility to a new site east of decommissioned runway 16/34.	1,130,000*
16. Construct a 2,000'x75' extension of taxiway A east to the northwest to full air-carrier strength and install taxiway lights.	1,223,000*
17. Decommission taxiways O, F, and K and indicate with appropriate pavement markings.	1,000*
18. Decommission taxiway E and about 400' of taxiway B east of runway 16/34 and remove pavement, as necessary.	24,000*
19. Extend the terminal apron to provide aircraft parking positions for up to 11 air-carrier aircraft and 12 commuter aircraft.	13,343,000
20. Expand the passenger terminal building and associated facilities, baggage conveyers, escalators, jetways, and other electrical and and mechanical services to accommodate up to 8 air-carrier gates and about 185,000 gross square feet of terminal building space.	20,720,000
21. Construct a north-south roadway about 1,800' long to provide access to the relocated crash/fire/rescue and airport maintenance building site and possible airline maintenance area east of decommissioned runway 16/34.	73,000

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
22. Construct the grade-separated airport entrance road.	$ 1,871,000
23. Construct a temporary parking lot to provide sufficient number of spaces to replace those removed when a parking garage is under construction.	500,000
24. Construct a parking garage in front of the passenger terminal building to provide about 1,650 spaces for the public, rental car, and terminal complex employee parking. Approximately 30% (270) of the public spaces should be allocated to short-term parking.	10,468,000
25. Remove hangars and fuel farms in the east approach to runway 9R/27L.	294,000*
26. Complete Phase 2 of the Airport Storm Drainage Master Plan.	518,000*
Total Phase II Project Costs:	$ 50,337,000
Phase III (1996 - 2005):	
27. Construct a 2,300'x75' additional extension of taxiway A east to the northwest to full air-carrier strength and install taxiway lights.	$ 1,407,000*
28. Widen 2,400' of taxiway A west by 50' to the south and decommission the northern 50' to maintain the minimum required separation with the taxiway A east extension; relocate taxiway lights; and indicate decommissioned portion with appropriate pavement markings.	685,000*
29. Construct 3 additional gates and associated facilities to provide an expanded (11-gate) passenger terminal building of about 220,000 gross square feet.	12,023,000
30. Expand the roadway system in the airport industrial park to provide access to new sites.	96,000
31. Expand water and natural gas utility lines to accommodate an expanded airport industrial park.	224,000*
32. Complete Phase 3 of the Airport Storm Drainage Master Plan.	563,000*
Total Phase III Project Costs:	$14,998,000
Total Cost of 3-Phase Capital Improvement Program:	$80,768,000**

*Project may be eligible for FAA matching funds.

**Stated in 1985 dollars.

City: **BOULDER**

Airport Name: **BOULDER**

County: Jefferson

Elev: 5,068'

NPIAS: No

Based Aircraft:

	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

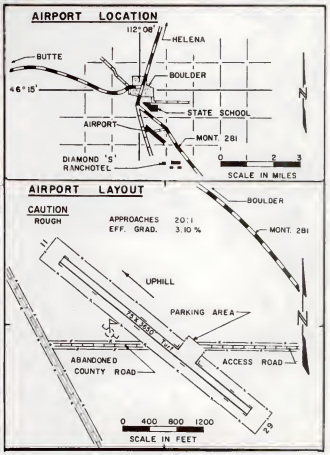
Operations: 1,650 1,980

Runway Data: 11/29, 3,650'x75', turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

This strip cannot be lengthened to a BUI length. It should be maintained and operated as a VFR-daylight use only airport.

COSTS

City: **BOZEMAN**

Airport Name: **GALLATIN FIELD**

County: Gallatin

Elev: 4,462′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	74	86
Multi Engine:	5	9
Turbojet:	1	2
Other:	7	7

Operations: 50,760 71,100

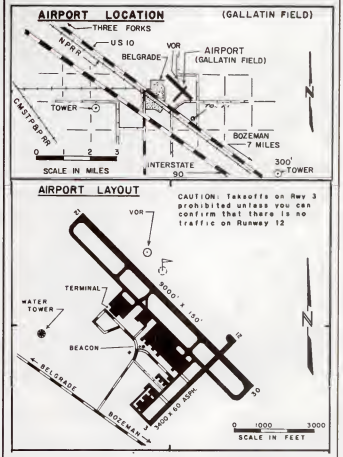
Runway Data: 12/30, 9,000′x150′, paved (good), 4-box VASI on both ends, ILS on 12, MALSR 12

3/12, 3,400′x60′, paved (very good)

Taxiway Data: Full parallel taxiway on 12/30, paved (good), MITL

Apron Data: 94,000 sy GA, 24,778 sy airline, paved (very good)

Beacon: Yes Nav. Aids: VOR 112.2
NDB 266



RECOMMENDED IMPROVEMENTS

A construction project is scheduled for the summer of 1988, which includes plans to:

	COSTS
o Overlay runway 12/30 and pave the shoulders	$ 675,000*
o Install new MITL system	$ 170,000*
o Pave taxiway shoulders	685,000*
o Enlarge snow removal equipment building	205,000*

The following recommendations are based on discussions with Ted Mathis.

1991

o Install a terminal radar service and control tower	(Cost Unknown)*

1994

o Extend Runway 12/30 to 12,000′x150′	$1,250,000*
o Construct paved run-up area on both ends of runway 12/30	225,000*
o Construct a new equipment building built for ground support equipment	675,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
1999	
o Expand the terminal to accommodate two additional commercial service gates	$2,800,000*
o Expand the commercial airline apron area	365,000*
o Expand the vehicle parking area for an additional 200 cars	150,000*
2005	
o Construct an interstate interchange to improve airport access	$3,000,000*

*Project may be eligible for FAA matching funds.

City: **BRIDGER**

Airport Name: **BRIDGER MUNICIPAL**

County: Carbon

Elev: 3,720′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

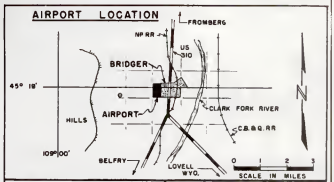
Operations: 1,700 2,040

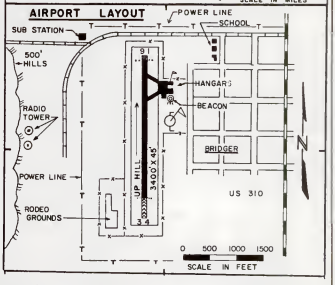
Runway Data: 16/34, 3,400′x45′, paved (fair, north end poor), LIRL, no markings

Taxiway Data: 170′x35′, paved (fair)
170′x35′, paved (fair)

Apron Data: 2,773 sy, paved (fair)

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

The last major construction project was completed in 1986.

1989

Runway 16/34 should be marked to meet FAA standards and the airspace improved to meet Part 77 requirements where possible. (Cost does not include airspace improvements.) — $ 5,000

1996

All paved areas should be rehabilitated. — $100,000

2006

All paved areas should be rehabilitated. — $100,000

City: **BROADUS**

Airport Name: **BROADUS**

County: Powder River

Elev: 3,034'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

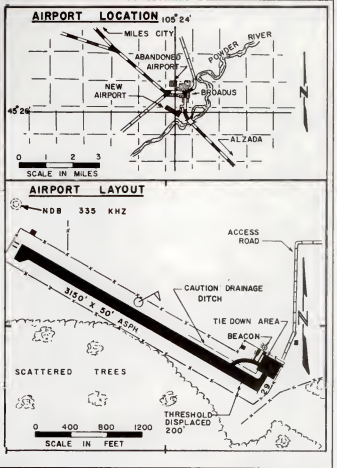
Operations: 1,875 2,250

Runway Data: 11/29, 3,150'x50', paved (poor), LIRL

Taxiway Data: 320'x30', paved (poor)
100'x40', paved (poor)

Apron Data: 200'x215', paved (poor), 5 tie-downs

Beacon: Yes Nav. Aids: NDB 335



RECOMMENDED IMPROVEMENTS

	COSTS
1992	
Develop airport to FAA standards.	$720,000*
2002	
All paved areas should be rehabilitated.	$140,000*

*Project may be eligible for FAA matching funds.

City: **BROWNING**

Airport Name: **STARR-BROWNING**

County: Glacier

Elev: 4,655′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

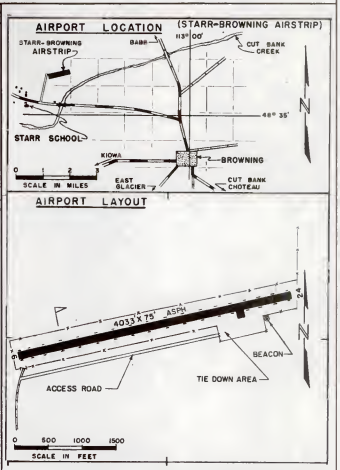
Operations: 400 480

Runway Data: 6/24, 4,033′x75′, paved (good)

Taxiway Data: 200′x40′, paved (good)

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1978.

1989

The airport currently is operated by the Montana Aeronautics Division. The State should sell the airport to the Blackfoot Tribal Council, the City, or the County. If transferred, the airport should be operated as a VFR-daylight use only facility. If not transferred, the State should evaluate the benefits and associated costs of operating the facility in determining whether the airport should remain open.

If transferred, all paved areas should be rehabilitated. The use of the beacon should be discontinued to discourage night-time use.

COSTS

$160,000

1999

All paved areas should be rehabilitated.

$160,000

City: **BUTTE**

Airport Name: **BERT MOONEY**

County: Silver Bow

Elev: 5,545′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	36	44
Multi Engine:	4	4

Operations: 26,860 41,400

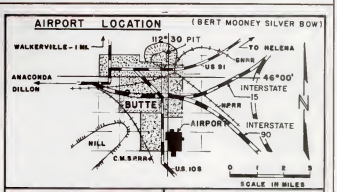
Runway Data: 15/33, 9′000′x150′, paved (good), MIRL, VASI on both ends; REIL and ILS on 33, REIL and lead-in lights on 33

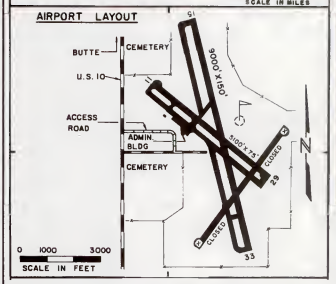
11/29, 5,100′x75′, paved (good), MIRL, VASI on both ends

Taxiway Data: 30,825′x75′, paved (good)

Apron Data: 29,861 sy GA, 39,861 sy airline, paved (good)

Beacon: Yes Nav. Aids: VOR 113.7
VOR 111.6





RECOMMENDED IMPROVEMENTS

The following recommendations were developed based on discussions with Angelo Petroni:

	COSTS
1989	
o Perform feasibility study for terminal expansion and update the master plan.	$ 70,000*
o Expand the existing terminal building or construct an entirely new terminal and commercial airline apron area (cost shown for new terminal and ramp).	2,200,000*
o Rehabilitate taxiways A, B, and C.	110,000*
o Reconstruct runway 11/29.	500,000*
o Reconstruct taxiway A.	600,000*
o Construct t-hangar access road.	22,000
o Purchase snow removal equipment.	80,000
o Install MALSR on 15.	150,000*
o Develop customs service at airport.	(Cost unknown)
1995	
o Expand and rehabilitate GA apron.	$ 950,000*
o Construct new CFR building.	240,000*
o Expand the equipment storage building.	170,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
1997	
o Rehabilitate runway 15/33.	$ 675,000*
1999	
o Rehabilitate runway 11/29 and all taxiways.	$ 500,000*
2005	
o Rehabilitate the apron area.	$ 230,000*
2007	
o Rehabilitate runway 15/33.	$ 675,000*
2009	
o Rehabilitate runway 11/29 and taxiways A and B.	$ 500,000*

*Project may be eligible for FAA matching funds.

City: **CANYON FERRY**

Airport Name: **CANYON FERRY**

County: Broadwater

Elev: 3,840′ NPIAS: No

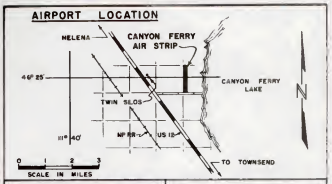
	1987	2005
Based Aircraft:		
Single Engine:	3	4
Multi Engine:	0	0
Operations:	350	420

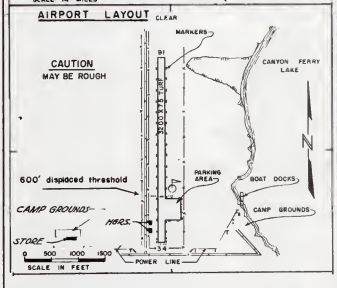
Runway Data: 16/34, 3,200′x75, turf/gravel (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

This airport is currently operated by Montana Aeronautics Division. The State should transfer ownership to Broadwater County or to interested local pilots.

If not transferred, the State should establish an airport-use fee schedule that will generate the necessary revenues to insure, operate, and maintain the facility.

The airport should be maintained as a VFR-daylight use only facility.

COSTS

City: **CHESTER**

Airport Name: **LIBERTY COUNTY**

County: Liberty

Elev: 3,169′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	18	22
Multi Engine:	0	0

Operations: 5,250 6,300

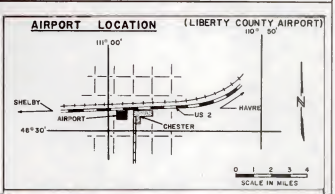
Runway Data: 7/25, 4,600′x75′, paved (good), MIRL, VASI on 25

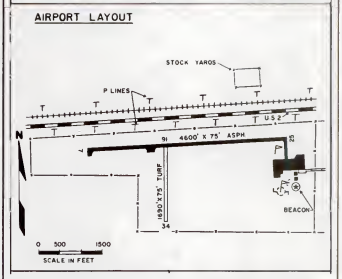
16/34, 1,690′x75′, turf (poor)

Taxiway Data: 320′x49′, paved (good)

Apron Data: 19,987 sy, paved (good), 16 tie-downs

Beacon: Yes Nav. Aids: NDB 323





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1995

All paved areas should be rehabilitated. $276,000*

2005

All paved areas should be rehabilitated. $276,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **CHINOOK**

Airport Name: **CHINOOK MUNICIPAL**

County: Blaine

Elev: 2,410′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	29	34
Multi Engine:	0	0

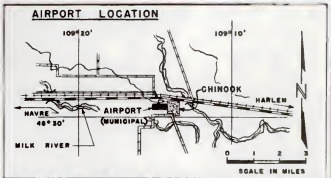
Operations: 7,525 9,030

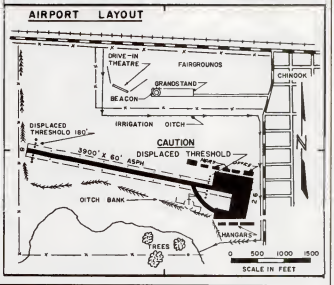
Runway Data: 8/26, 3,900′x60′, paved (fair), LIRL

Taxiway Data: 250′x30′, paved (fair)

Apron Data: 300′x350′, paved (fair), 10 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

	COSTS
1988	
Master Plan study underway.	
1989	
Develop airport to standards outlined in Master Plan.	$1,350,000*
1999	
All paved areas should be rehabilitated.	$ 210,000*

*Project may be eligible for FAA matching funds.

City: **CHOTEAU**

Airport Name: **CHOTEAU**

County: Teton

Elev: 3,945'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,800 3,360

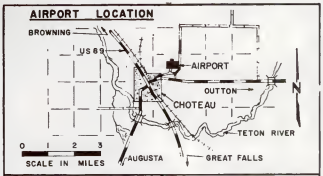
Runway Data: 5/23, 3,800'x60', paved (fair), MIRL

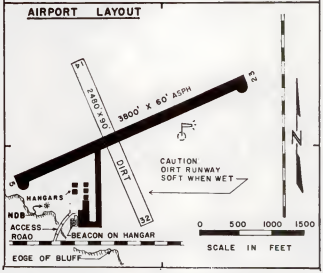
14/32, 2,480'x90', dirt (poor)

Taxiway Data: 1,200'x30', paved (fair)

Apron Data: 250'x165', paved (fair)
100'x225', paved (fair)

Beacon: Yes Nav. Aids: NDB 269





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1977.

1990

Rehabilitate all paved areas and extend 5/23; improve safety areas; relocate county road; and install glide slope indicators and perimeter fence.

COSTS

$600,000*

2000

All paved areas should be rehabilitated.

$169,000*

*Project may be eligible for FAA matching funds.

City: **CIRCLE**

Airport Name: **CIRCLE TOWN-COUNTY**

County: McCone

Elev: 2,426'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	10	12
Multi Engine:	0	0

Operations: 3,300 3,960

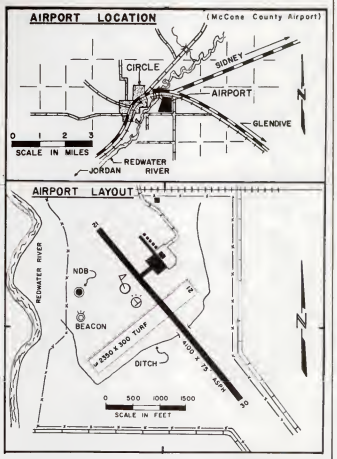
Runway Data: 12/30, 4,100'x75', paved (good). MIRL, VASI on 30

3/21, 2,350'x300', turf (fair)

Taxiway Data: 225'x30', paved (good)

Apron Data: 200'x150', paved (good)

Beacon: Yes Nav. Aids: NDB 245



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1981.

1994

All paved areas should be rehabilitated. $177,000*

2004

All paved areas should be rehabilitated. $177,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **CLINTON**

Airport Name: **ROCK CREEK-ELLIOT**

County: Missoula

Elev: 3,540'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	1	1
Multi Engine:	0	0

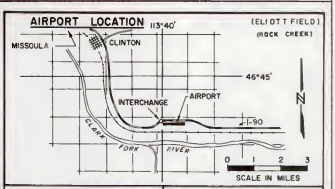
Operations: 250 300

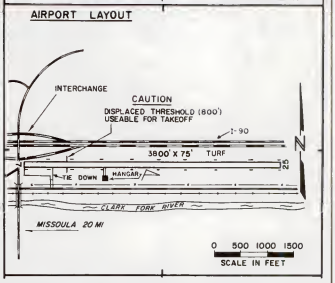
Runway Data: 7/25, 3,800'x75', turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

1989

This airport is operated by the Montana Aeronautics Division. The State should transfer all rights and responsibilities of the airport to Missoula County. If it is not transferred, the State should evaluate the benefits and associated operational costs of the airport to determine if it should remain open. If the airport remains open, the brush on the runway and the trees that penetrate the 20:1 approach surfaces should be removed.

$3,000

City: COLSTRIP	Airport Name: COLSTRIP (NEW)
County: Rosebud Elev: 3,290' Est. NPIAS: Yes 1987 2005 Based Aircraft: Single Engine: 0 19 Multi Engine: 0 0 Operations: 0 15,900 Runway Data: None Taxiway Data: None Apron Data: None Beacon: No Nav. Aids: No	Future airport. Date of development unknown.

RECOMMENDED IMPROVEMENTS

A site-location study was recently conducted, and a site at Armell's Creek West was selected for construction of the new airport. The necessary land (160 acres) should be acquired, and a 5,100'x75' paved runway with paved connecting taxiway and apron area should be constructed. A MIRL system, beacon, lighted wind cone, and glide slope indicators should be installed.

Non-airside improvements should include a terminal building, eight t-hangars, perimeter fence, and access road.

Construction date may vary based on funding availability.

*Portions of these projects may be eligible for FAA matching funds.

COSTS

$2,130,000*

City: **COLUMBUS**

Airport Name: **COLUMBUS**

County: Stillwater

Elev: 3,575'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	19	23
Multi Engine:	0	0
Other:	1	1

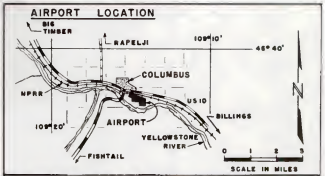
Operations: 4,800 5,760

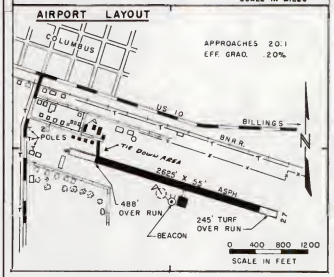
Runway Data: 9/27, 2,625'x55', paved (poor), LIRL

Taxiway Data: 270'x20', paved (poor)

Apron Data: Turf

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

1991

Master Plan underway; develop airport to standards outlined in Master Plan. $760,000*

2001

All paved areas should be rehabilitated. $145,000*

*Project may be eligible for FAA matching funds.

City: **CONDON**

Airport Name: **CONDON (USFS)**

County: Missoula

Elev: 3,684′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

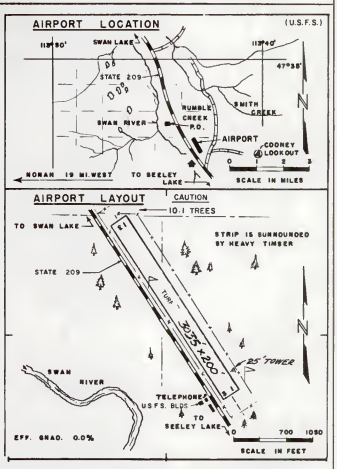
Operations: 250 300

Runway Data: 13/31, 3,035′x200′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

The trees that penetrate the 20:1 runway approach surfaces should be removed.

COSTS

$3,000

City: **CONRAD**

Airport Name: **CONRAD**

County: Pondera

Elev: 3,535'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	15	18
Multi Engine:	0	0

Operations: 4,175 5,010

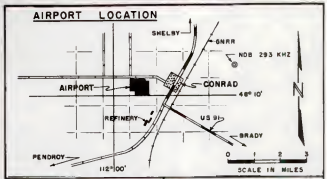
Runway Data: 5/23, 4,600'x75', paved (very good), MIRL, REIL and VASI on 23, NPI on 23

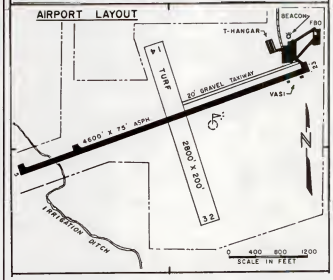
14/32, 2,800'x90', turf

Taxiway Data: 170'x25', paved (very good)
170'x25', paved (very good)

Apron Data: 500'x220', paved (very good), 14 tie-downs

Beacon: Yes Nav. Aids: NDB 293





RECOMMENDED IMPROVEMENTS

COSTS

1988

A major reconstruction project is scheduled for the summer of 1988. (Note: The data above reflects the improvements to be completed in 1988.) Project includes:

- o Overlay runway 5/23
- o Reconstruct apron (11,000) sy)
- o Construct two connecting taxiways
- o Subsurface and storm water drainage system around apron area
- o Safety area improvements on runway 5/23

$550,000*

1990

A perimeter fence should be installed.

$ 30,000*

1999

All paved areas should be rehabilitated.

$238,000*

*Project may be eligible for FAA matching funds.

City: **CULBERTSON**

Airport Name: **BIG SKY FIELD**

County: Roosevelt

Elev: 1,953′ NPIAS: Yes

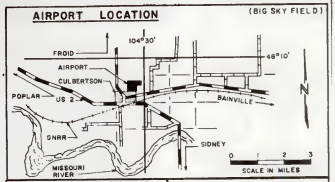
	1987	2005
Based Aircraft:		
Single Engine:	12	14
Multi Engine:	0	0
Operations:	3,850	4,620

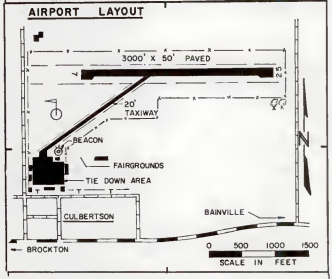
Runway Data: 7/25, 3,000′x50′, paved (fair), MIRL

Taxiway Data: 1,380′x20′, paved (fair)

Apron Data: 4,624 sy, paved (fair), 4 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1977.

1993

Rehabilitate and widen 7/25; remove obstructions; expand apron; rehabilitate and widen taxiway; install airport lighting and glide slope indicators. — $500,000*

2003

All paved areas should be rehabilitated. — $158,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **CUT BANK**

Airport Name: **CUT BANK MUNICIPAL**

County: Glacier

Elev: 3,854′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	26	32
Multi Engine:	2	2
Rotocraft:	2	2

Operations: 7,500 9,000

Runway Data: 4/22, 5,300′x75′, paved (good), MIRL

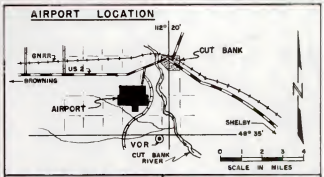
13/31, 5,300′x75′, paved (good), MIRL, VASI on 31, REIL on 31

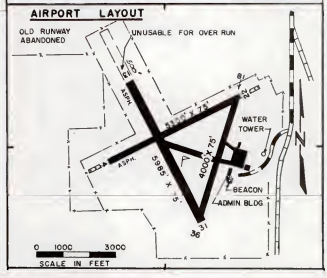
18/36, 4,000′x75′, paved (fair)

Taxiway Data: 2,575′x40′, paved (good) 425′x75′, paved (fair)

Apron Data: 16,000 sy, paved (fair), 165 tie-downs

Beacon: Yes Nav. Aids: VOR 114.4





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1983.

1990

Remove excess pavement from the west side of Runway 13/31 and from overrun off the 13 end. Runways 4/22 and 13/31 should be rehabilitated. All taxiways and the apron area should be rehabilitated. Improve runway safety areas.

2000

Rehabilitate all paved areas.

*Project may be eligible for FAA matching funds.

COSTS

$1,000,000*

$ 529,000*

City: **DEER LODGE**

Airport Name: **DEER LODGE CITY-COUNTY**

County: Powell

Elev: 4,665'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	11	13
Multi Engine:	0	0

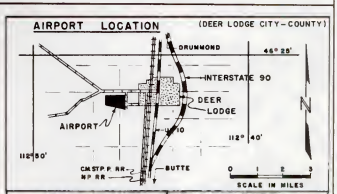
Operations: 2,925 3,510

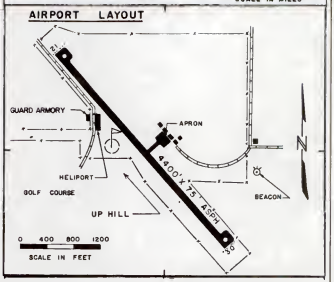
Runway Data: 12/30, 4,400'x75', paved (very good), MIRL, VASI on both ends

Taxiway Data: 175'x49', paved (very good)

Apron Data: 4,311 sy, paved (very good), 7 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1995

All paved areas should be rehabilitated. — $195,000*

2005

All paved areas should be rehabilitated. — $195,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **DEL-BONITA**

Airport Name: **WHETSTONE INT'L.**

County: Glacier

Elev: 4,336'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

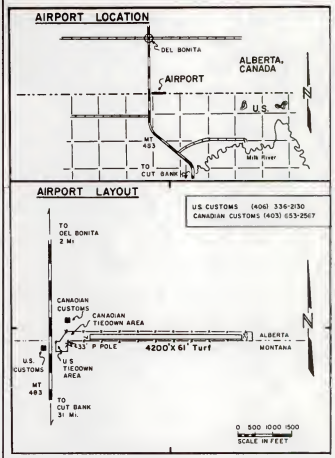
Operations: 200 240

Runway Data: 7/25, 4,200'x61', turf

Taxiway Data: None

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

The airport currently is operated by the Montana Aeronautics Division. The State should transfer all rights and responsibilities of the airport to the local pilots or the government of Alberta. If not transferred, the State should evaluate the benefits and associated operating costs to determine if the airport should remain open. If so, the State should establish a use fee to generate the revenue necessary to operate, insure, and maintain the facility.

COSTS

City: **DELL**

Airport Name: **DELL FLIGHT STRIP**

County: Beaverhead

Elev: 6,007′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

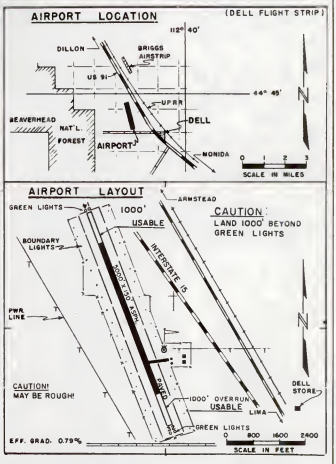
Operations: 1,350 1,620

Runway Data: 14/32, 5,000′x150′, paved (very poor), boundary lights only. (1,000′ paved overruns on both ends)

Taxiway Data: 600′x20′, paved (very poor)

Apron Data: None

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

COSTS

1989

This airport is currently operated by the Montana Aeronautics Division. The State should transfer ownership to Beaverhead County or to interested local pilots. If not transferred, the State should establish an airport-use fee schedule that will generate sufficient revenues to cover the costs of insuring, operating, and maintaining the facility. If local funds are available, the runway should be reconstructed to a BUI length (5,200′x60′ paved). A connecting taxiway (300′x25′) and apron (1,500 sy) should also be constructed.

$242,000

1999

All paved areas should be rehabilitated.

$167,000

City: **DENTON**

Airport Name: **DENTON**

County: Fergus

Elev: 3,592′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

Operations: 250 300

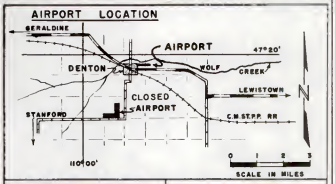
Runway Data: 9/27, 2,500′x168′, turf

Taxiway Data: None

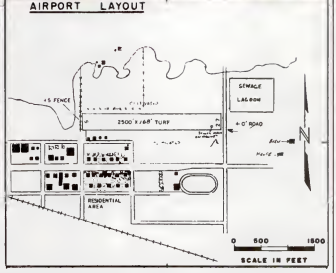
Apron Data: Turf

Beacon: No Nav. Aids: No

AIRPORT LOCATION



AIRPORT LAYOUT



RECOMMENDED IMPROVEMENTS

This airport should be maintained as a VFR-daylight use only facility.

COSTS

City: **DILLON**

Airport Name: **DILLON**

County: Beaverhead

Elev: 5,238′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	11	13
Multi Engine:	1	1

Operations: 3,950 4,740

Runway Data: 16/34, 6,500′x75′, paved (very good), MIRL, PAPI on 16

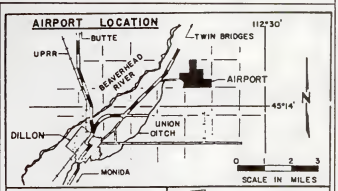
3/21, 3,600′x60′, paved (very good), MIRL, PAPI on 21

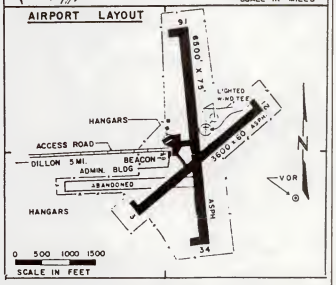
7/25, closed as part of 1988 project

Taxiway Data: 190′x25′, paved (very good)
200′x25,′ paved (very good)

Apron Data: 15,200 sy paved (very good), 14 tie-downs

Beacon: Yes Nav. Aids: NDB 379
VOR 113.9





RECOMMENDED IMPROVEMENTS

COSTS

1988

Total reconstruction is scheduled. (Note: Data shown above reflects the scheduled improvements.) The project includes:

- o Land acquisition
- o Realign and extend Runway 16/34 (6,500′x75′)
- o Pave crosswind Runway 3/21 (3,600′x60′)
- o Close Runway 7/25
- o Two paved taxiways (190′x25′ and 200′x25′)
- o Paved apron area (13,200 sy)
- o MIRL on 16/34 and 3/21
- o Beacon
- o Lighted wind cone
- o Glide slope indicators on 16 and 21
- o Perimeter fencing

$1,200,000*

1998

All paved areas should be rehabilitated.

$ 435,000*

*Project may be eligible for FAA matching funds.

City: **DRUMMOND**

Airport Name: **DRUMMOND**

County: Granite

Elev: 4,245'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

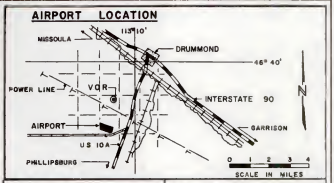
Operations: 150 180

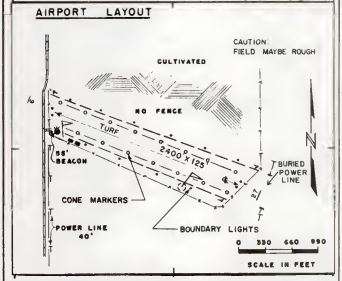
Runway Data: 9/27, 2,400'x125', turf (fair 5010), boundary lights only

Taxiway Data: None

Apron Data: Turf

Beacon: Yes Nav. Aids: VOR 117.1 No NDB





RECOMMENDED IMPROVEMENTS

1994

A Master Plan Study is underway and is examining this airport to determine if it meets the requirements for inclusion in the NPIAS; develop airport to standards as outlined in the Master Plan.

COSTS

$769,000*

2004

All paved areas should be rehabilitated.

$155,000*

*Project may be eligible for FAA matching funds if airport is added to NPIAS.

City: **DUTTON**

Airport Name: **DUTTON**

County: Teton

Elev: 3,695′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	7	8
Multi Engine:	0	0

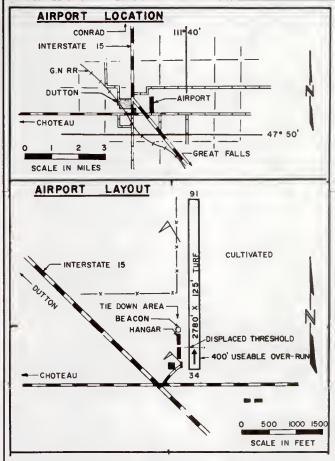
Operations: 3,125 3,750

Runway Data: 16/34, 2,780′x125′, turf (good), LIRL

Taxiway Data: None

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

The depression in the runway on the 16 end should be filled. A perimeter fence should be constructed.

COSTS

$27,000

City: **EAST POPLAR**

Airport Name: **EAST POPLAR INT'L.**

County: Daniels

Elev: 2,501'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

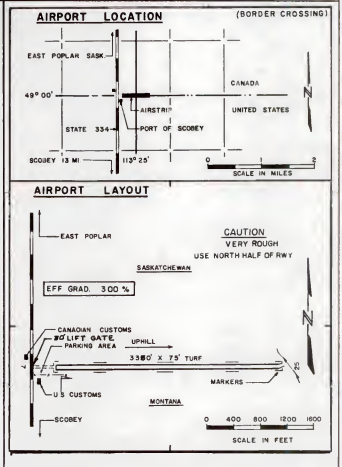
Operations: 200 240

Runway Data: 7/25, 3,350'x75', turf and gravel (poor)

Taxiway Data: None

Apron Data: None

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

This low-activity airport is currently operated by Montana Aeronautics Division. It is recommended that ownership of the airport be transferred to Daniels County and maintained as a VFR-daylight use only facility. If the airport is not transferred to the County, the State should evaluate the benefits and associated costs of operating this facility. A usage fee should be established to generate the revenue necessary to operate, insure, and maintain the airport, if it is to remain open and State-owned.

COSTS

City: **EKALAKA**

Airport Name: **EKALAKA**

County: Carter

Elev: 3,480′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	6	7
Multi Engine:	0	0

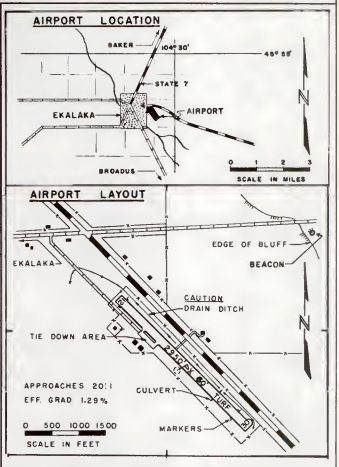
Operations: 2,550 3,060

Runway Data: 12/30, 2,950′x60′ (gravel), LIRL

Taxiway Data: None

Apron Data: Gravel, 3 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

COSTS

1992

The existing airport site does not meet all of the Part 77 airspace requirements. Maintain the existing strip while conducting a site-evaluation study. Construct a new facility on the site determined to be the most acceptable. The new facility should include a paved 3,700′x60′ runway complete with paved, connecting taxiway and apron area, adequate runway safety areas, MIRL, beacon, and lighted wind cone. $720,000*

2002

All paved areas should be rehabilitated. $142,000*

*Project may be eligible for FAA matching funds.

City: **ENNIS**

Airport Name: **BIG SKY AIRPARK**

County: Madison

Elev: 5,360′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	12	16
Multi Engine:	1	8

Operations: 3,575 4,290

Runway Data: Existing 16/34, 5,280′x125′, turf (fair), LIRL

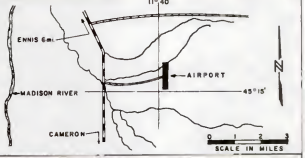
Proposed 16/34, 4,700′x60′, paved, MIRL, PAPI's on both ends (construction scheduled for 1989)

Taxiway Data: Existing-turf
Proposed-192′x25′, paved

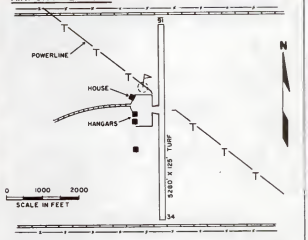
Apron Data: Existing-turf
Proposed-13,900 sy, paved

Beacon: Yes Nav. Aids: No

AIRPORT LOCATION (BIG SKY AIRPORT)



AIRPORT LAYOUT



RECOMMENDED IMPROVEMENTS

1990

Master Plan underway; develop airport to standards outlined in the Master Plan.

COSTS

$1,130,000*

2000

All paved areas should be rehabilitated.

$ 212,000*

*Project may be eligible for FAA matching funds.

City: **EUREKA**

Airport Name: **EUREKA**

County: Lincoln

Elev: 2,680′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	9	11
Multi Engine:	1	1

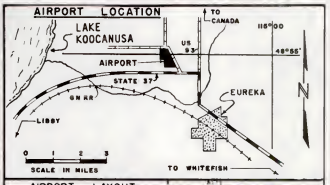
Operations: 2,750 3,300

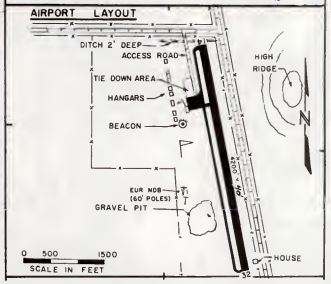
Runway Data: 14/32, 4,200′x42′, paved (very poor), LIRL

Taxiway Data: 200′x30′, paved (very poor) 4,020′x22′, paved (very poor)

Apron Data: Paved (very poor)

Beacon: Yes Nav. Aids: NDB 392





RECOMMENDED IMPROVEMENTS

A Site Selection Study is currently underway to determine the best location for the airport. The new location is uncertain at this time.

1990

Master Plan underway; develop airport to standards outlined in Master Plan. — $800,000*

2000

All paved areas should be rehabilitated. — $158,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **FAIRFIELD**

Airport Name: **FAIRFIELD**

County: Teton

Elev: 3,989'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,750 3,300

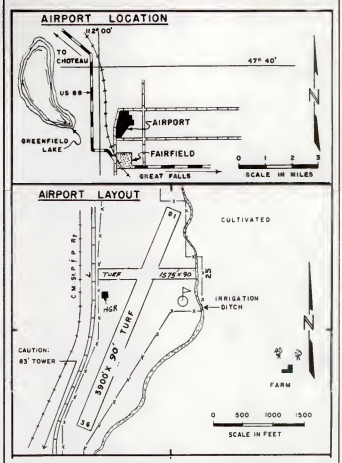
Runway Data: 18/36, 3,900'x90', turf-gravel (good), LIRL

7/25, 1,575'x90', turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

This airport should continue to be maintained and operated as a public-use facility.

COSTS

City: **FAIRVIEW**

Airport Name: **FAIRVIEW**

County: Richland

Elev: 2,152'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	1	1
Multi Engine:	0	0

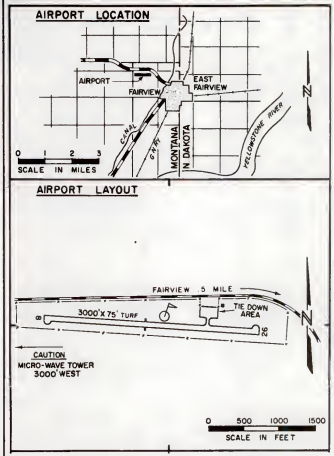
Operations: 600 720

Runway Data: 8/26, 3,000'x75', turf (good)

Taxiway Data: Turf

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The existing facility should be maintained and operated as a VFR-daylight use only airport.

COSTS

City: **FORSYTH**

Airport Name: **TILLITT FIELD**

County: Rosebud

Elev: 2,726'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	23	27
Multi Engine:	0	0

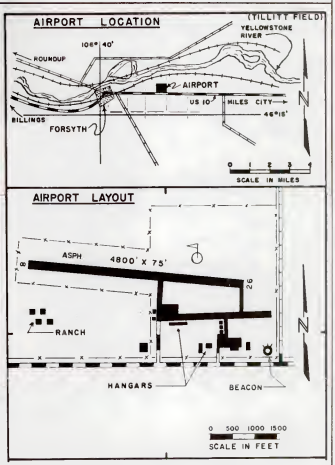
Operations: 5,625 6,750

Runway Data: 8/26, 4,800'x75', paved (very good), MIRL, VASI on both ends

Taxiway Data: 2,500'x50', paved (very good)
800'x40', paved (very good)

Apron Data: 330'x225', paved (very good), 15 tie-downs

Beacon: Yes Nav. Aids: NDB 236



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1995

All paved areas should be rehabilitated. $286,000*

2005

All paved areas should be rehabilitated. $286,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **FORT BENTON**

Airport Name: **FORT BENTON**

County: Chouteau

Elev: 2,886′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	17	21
Multi Engine:	1	1

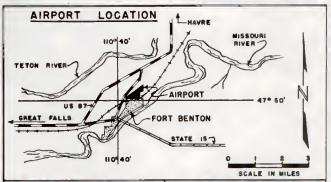
Operations: 4,650 5,580

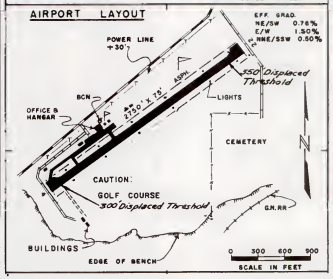
Runway Data: 4/22, 2,750′x75′, paved (poor), MIRL

Taxiway Data: 700′x40′, paved (poor)
150′x30′, paved (poor)

Apron Data: 2,222 sy (100′x200′), paved (poor), 4 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

COSTS

1994

Master Plan underway; develop airport to standards outlined in the Master Plan. — $1,135,000*

2004

All paved areas should be rehabilitated. — $ 190,000*

*Project may be eligible for FAA matching funds.

City: **FORT SMITH**

Airport Name: **YELLOWTAIL DAM**

County: Big Horn

Elev: 3,242′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

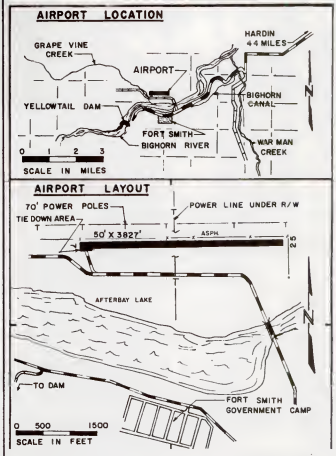
Operations: 350 420

Runway Data: 7/25, 3,827′x50′, paved (good)

Taxiway Data: None

Apron Data: 100′x200′, paved (good), 3 tie-downs

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The airport was constructed in the late 1960′s. The runway was fog-sealed in 1980.

1989

The fence on 25 should be relocated to yield a 20:1 approach surface; and the power poles on the north side of the field should be marked.

All paved areas should be rehabilitated. $112,000

1999

Paved areas will need to be rehabilitated. $110,000

COSTS

City: **GARDINER**

Airport Name: **GARDINER**

County: Park

Elev: 5,286′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	10	13
Multi Engine:	1	1

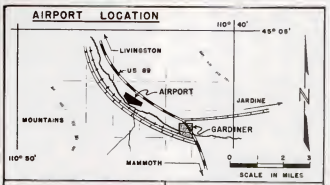
Operations: 3,425 4,110

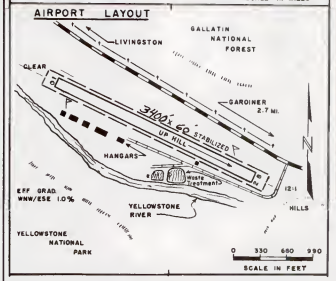
Runway Data: 10/28, 3,400′x60′, stabilized gravel (very poor), LIRL

Taxiway Data: 100′x25′, gravel (poor)

Apron Data: 75′x700′, gravel (poor)

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

	COSTS
1989	
Develop airport to applicable FAA standards.	$700,000*
1999	
All paved areas should be rehabilitated.	$173,000*

*Project may be eligible for FAA matching funds.

City: **GERALDINE**

Airport Name: **GERALDINE**

County: Chouteau

Elev: 3,173′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

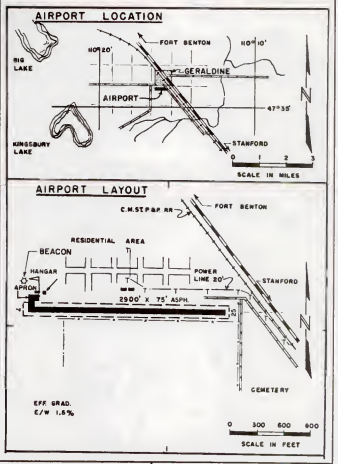
Operations: 3,800 4,560

Runway Data: 7/25, 2,900′x75′, paved (very good), LIRL

Taxiway Data: 75′x40′, paved (very good)

Apron Data: 100′x150′, paved (very good), 3 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1986.

1989

The runway should be marked according to FAA standards.

A perimeter fence should be installed. $ 31,000

1996

All paved areas should be rehabilitated. $122,000

2006

All paved areas should be rehabilitated. $122,000

COSTS

City: **GLASGOW**

Airport Name: **GLASGOW INT'L.**

County: Valley

Elev: 2,293'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	32	39
Multi Engine:	1	1

Operations: 26,100 35,800

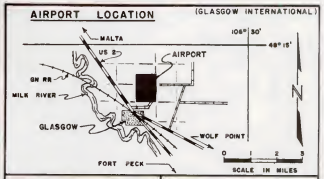
Runway Data: 7/25, 5,006'x75', paved (good), MIRL, VASI on 25

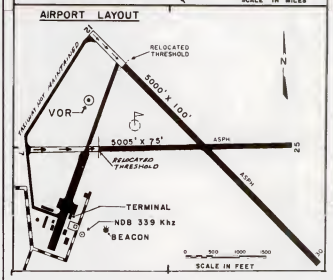
12/30, 5,000'x100', paved (good), MIRL, VASI on both ends, REIL on 30

Taxiway Data: 800'x150', paved (good), MITL
2,500'x60, paved (good)
500'x50', paved (good)

Apron Data: 11,111 sy paved (good)

Beacon: Yes Nav. Aids: VOR 113.9





RECOMMENDED IMPROVEMENTS

The last major construction project on runway 12/30 was completed in 1977 while all other paved areas were overlaid in 1985.

1989

- o Runway 12/30 should be rehabilitated.
- o Expand GA fueling area.
- o Expand commercial fueling area.
- o Construct new taxiways to serve t-hangar area.
- o Install new 10-inch water main from water tower to terminal area.

1995

Runway 7/25, all taxiways, and the apron area should be rehabilitated.

1999

Runway 12/30 should be rehabilitated.

2005

Runway 7/25, all taxiways and the apron area should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$700,000*

$329,000*

$257,000

$329,000*

City: **GLASGOW**

Airport Name: **VALLEY INDUSTRIAL PARK**

County: Valley

Elev: 2,760′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

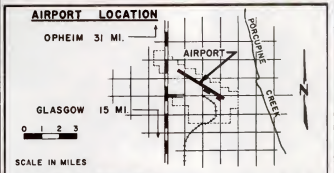
Operations: 1,000 1,200

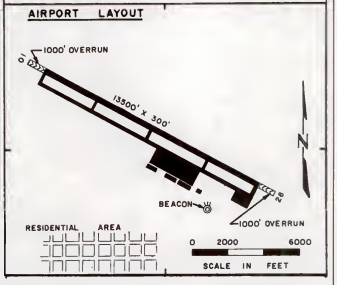
Runway Data: 10/28, 13,500′x300′, paved (fair), HIRL

Taxiway Data: Full parallel taxiway, paved (fair), MITL

Apron Data: Concrete (fair)

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

This facility is currently owned and operated by Valley Airport Enterprises, Inc. and should be maintained at a level that provides for the safe operation of the activity anticipated and compatible with the future plans of this airfield.

COSTS

City: **GLENDIVE**

Airport Name: **DAWSON COMMUNITY AIRPORT**

County: Dawson

Elev: 2,456′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	29	34
Multi Engine:	0	1

Operations: 6,634 9,600

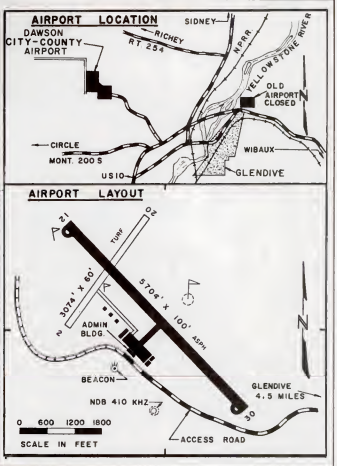
Runway Data: 12/30, 5,704′x100′, paved (very good), MIRL, VASI and REIL on both ends

2/20, 3,074′x60′, turf (fair 5010)

Taxiway Data: 950′x40′, paved (very good)
600′x50′, paved (very good)

Apron Data: 21,806 sy, paved (very good), 19 tie-downs

Beacon: Yes Nav. Aids: NDB 410



RECOMMENDED IMPROVEMENTS	COSTS
The last major project was completed in 1985.	
1989	
Runway 2/20 should be paved and lighted and the runway safety areas should be improved.	$412,000*
1990	
The access road should be upgraded.	$370,000
1995	
Rehabilitate 12/30, the taxiways, and apron.	$344,000*
2000	
Rehabilitate 2/20.	$ 95,000*
2005	
Rehabilitate 12/30, taxiways, and apron.	$344,000*

*Project may be eligible for FAA matching funds.

City: **GREAT FALLS**

Airport Name: **GREAT FALLS INT'L.**

County: Cascade

Elev: 3,674'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	62	81
Multi Engine:	19	23
Turbojet:	2	5
Rotocraft:	5	2
Military:	25	25

Operations: 64,000 85,400

Runway Data: 3/21, 10,502'x150', paved (good), HIRL, ILS and MASLR on 03, VASI on both ends, REIL on 21

16/34, 6,350'x150', paved (good), HIRL, ILS on 34

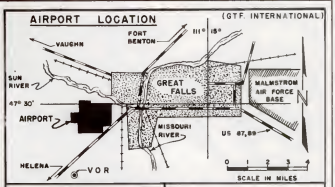
7/25, 4,308'x75', paved (good), MIRL

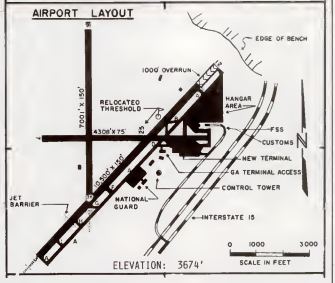
Taxiway Data: Full parallel taxiway on 3/21, paved (good), MITL

Apron Data: Commercial apron - concrete (good); GA apron - paved (fair)

Beacon: Yes

Nav. Aids: TRSA-Stage III
VOR 115.1
NDB 371
Control Tower





RECOMMENDED IMPROVEMENTS

The following recommendations are from the Airport Master Plan:

Phase 1 (Present - 1990)

	COSTS
1. Acquire approximately 22 acres of private land for the clear zone at the northeastern end of Runway 3/21.	$ 132,000*
2. Acquire approximately 46 acres of private land for the clear zone at the northern end of Runway 16/34.	55,000*
3. Acquire approximately 23 acres of private land at the western end of Runway 7/25 for noise compatibility purposes.	12,000*
4. Acquire approximately 3 acres of private land at the southeastern side of the airport for noise compatibility and airport purposes.	100,000*
5. Acquire approximately 95 acres of private land at the southeastern side of the airport for noise compatibility and airport purposes.	114,000*
6. Acquire approximately 405 acres of private land at the southwestern side of the airport for noise compatibility purposes.	203,000*
7. Install approximately 12,000 linear feet of fencing around the newly acquired clear zone properties.	24,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
8. Replace passenger terminal building roof.	$ 200,000
9. Overlay airport access road.	100,000
10. Resurface public parking lot.	30,000
11. Resurface parking lot adjacent to the old terminal building.	30,000
12. Overlay Avenues A, B, and C southwest of the terminal building.	60,000
13. Overlay the access road in the general aviation area leading to the Rocky Mountain Air leasehold.	20,000
14. Enlarge the rental car parking lot to provide spaces for about 15 more cars.	12,000
15. Construct first phase of airport perimeter road.	253,000
16. Acquire avigation easements for the two dwelling units within the northeastern approach to Runway 3/21 and exposed to aircraft noise levels of Ldn (day-night sound level) 70 to 75.	100,000*
17. Install new roof on Hangar #2.	100,000
18. Complete reroofing of Hangar #1.	50,000
Total Phase 1 project costs:	$1,595,000
Phase 2 (1991-1995)	
19. Construct a 3,300'x75' taxiway parallel to and northwest of the northern end of Runway 3/21 to accommodate air carrier and general aviation aircraft.	$ 521,000*
20. Construct a general aviation apron adjacent to the new taxiway parallel to Runway 3/21 to accommodate aircraft up to 30,000 pounds.	786,000*
21. Add aircraft loading gate and holdroom in the passenger terminal building.	300,000
22. Enlarge the public parking lot to provide spaces for about 100 more cars.	81,000
23. Enlarge the employee parking lot to provide spaces for about 10 more cars.	8,000
24. Construct second phase of airport perimeter road.	692,000
25. Extend utilities to serve the commercial/industrial areas at the southeastern end of the airport.	1,558,000
26. Extend utilities to serve the open recreation area at the southwestern and western sides of the airport.	331,000
Total Phase 2 project costs:	$4,277,000
Phase 3 (1996-2005)	
27. Construct a 4,600'x75' taxiway parallel to and west of Runway 16/34 to accommodate air carrier and general aviation aircraft.	$1,278,000*
28. Construct a 3,500'x75' taxiway parallel to and south of Runway 7/25 to accommodate air carrier and general aviation aircraft.	691,000*
29. Construct a 400'x75' extension of the taxiway parallel to Runway 3/21 to connect with the new taxiway parallel to Runway 7/25.	95,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
30. Enlarge the public parking lot to provide spaces for about 125 more cars.	$ 101,000
31. Enlarge the employee parking lot to provide spaces for about 15 more cars.	12,000
33. Enlarge the rental car parking lot to provide spaces for about 15 more cars.	12,000
Total Phase 3 project costs:	$2,189,000
Total cost of three-phase Capital Improvement Program:	$8,061,000**

*Project may be eligible for FAA matching funds.
**Stated in 1985 dollars.

City: **HAMILTON**

Airport Name: **HAMILTON**

County: Ravalli

Elev: 3,640′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	47	55
Multi Engine:	2	3

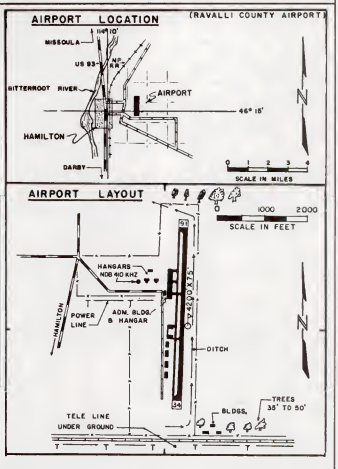
Operations: 10,550 12,660

Runway Data: 16/34, 4,200′x75′, paved (fair), MIRL, VASI on both ends

Taxiway Data: 4,200′x30′, parallel, paved (fair)
150′x75′, paved (fair)
150′x75′, paved (fair)

Apron Data: 21,743 sy, paved (fair, 44 tie-downs

Beacon: Yes Nav. Aids: NDB 410



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1980.

1989

Correct pavement frost heaving problems; provide additional hangar space (no cost provided); acquire land and extend runway 16/34 and parallel taxiway; rehabilitate all paved areas and expand apron area.

1999

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$1,325,000*

$ 392,000*

City: **HARDIN**

Airport Name: **FAIRGROUNDS AIRPARK**

County: Big Horn

Elev: 2,911′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	14	17
Multi Engine:	0	0

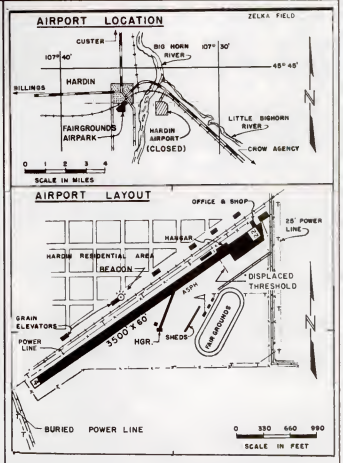
Operations: 5,050 6,060

Runway Data: 4/22, 3,500′x60′, paved (good), LIRL

Taxiway Data: 2,100′x30′, paved (good)

Apron Data: 150′x600′, paved (good), 8 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

Runway 4/22 was overlaid in 1982, and the apron area was overlaid in 1986.

1989

All airspace obstructions should be removed where feasible and all others lighted (no cost estimate available).

A shielded glide slope indicator should be installed on 22.

A fence should be installed on the south side of field between the airport and the fairgrounds. — $ 15,000

1994

All paved areas should be rehabilitated. — $186,000

COSTS

City: **HARLEM**

Airport Name: **RIGGIN MEMORIAL**

County: Blaine

Elev: 2,640'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	11	13
Multi Engine:	0	0

Operations: 2,925 3,510

Runway Data: 11/29, 4,100'x60', paved (fair), MIRL, PLASI on 29

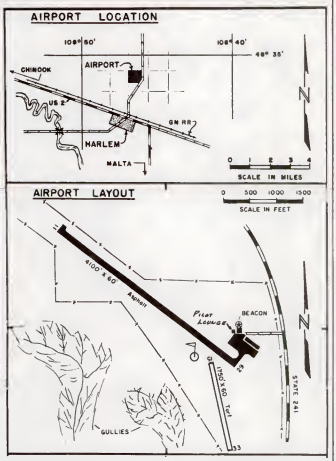
15/33, 1,750'x60', turf

6/24, 1,045'x60', turf

Taxiway Data: 150'x40', paved (fair)

Apron Data: 4,131 sf paved (fair), 5 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major construction project was in 1984.

1990

All paved areas should be rehabilitated and the safety areas improved.

2000

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$155,000*

$150,000*

City: **HARLOWTON**

Airport Name: **HARLOWTON**

County: Wheatland

Elev: 4,309'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,400 2,880

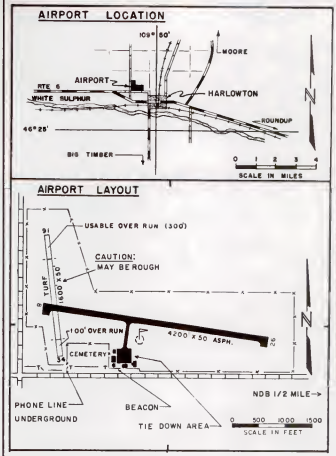
Runway Data: 8/26, 4,200'x50', paved (good), MIRL, VASI on 26

16/34, 1,600'x50', turf (good)

Taxiway Data: 500'x40', paved (good)

Apron Data: 220'x220', paved, 11 tie-downs

Beacon: Yes Nav. Aids: NDB 242



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1976.

1991

Rehabilitate and widen 8/26; rehabilitate taxiway and apron; improve safety area.

2001

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$415,000*

$166,000*

City: **HAVRE**

Airport Name: **HAVRE CITY-COUNTY**

County: Hill

Elev: 2,584′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	32	37
Multi Engine:	4	5
Turbojet:	0	1

Operations: 21,048 31,250

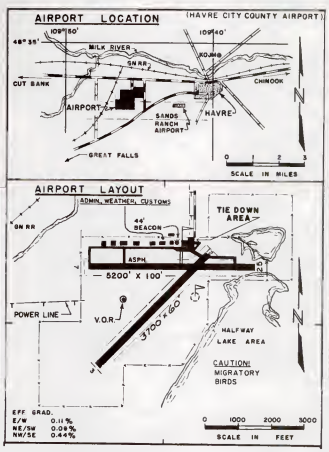
Runway Data: 7/25, 5,200′x100′, paved (fair), MIRL, VASI on both ends

3/21, 4,750′x75′, paved (fair), MIRL, VASI on 21

Taxiway Data: 2,950′x50′, paved (poor), MITL
500′x50′, paved (poor), MITL
1,800′x50′, paved (good), MITL

Apron Data: 10,500 sy GA, 1,111 sy airline, paved (fair)

Beacon: Yes Nav. Aids: VOR 111.8
NDB 389



RECOMMENDED IMPROVEMENTS

The last major projects were as follows:

- o Runway 7/25 was chip-sealed in 1983
- o Runway 3/21 was reconstructed in 1985
- o In 1987, the apron was enlarged, a helipad was installed, the beacon replaced, and the safety area off the end of 07 was improved.

	COSTS
1993	
Rehabilitate 7/25, taxiways, and apron.	$450,000*
1995	
Rehabilitate 3/21.	$190,000*
2003	
Rehabilitate 7/25, taxiways, and apron.	$450,000*
2005	
Rehabilitate 3/21.	$190,000*

*Projects may be eligible for FAA matching funds.

City: **HELENA**

Airport Name: **HELENA REGIONAL**

County: Lewis & Clark

Elev: 3,873′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	92	120
Multi Engine:	11	12
Rotocraft:	2	2
Military:	45	46
Other:	1	1
Operations:	60,479	80,600

Runway Data: 9/27, 9,000′x150′, paved (good), HIRL, ILS on 27, VASI on 9 and 27

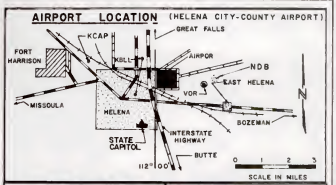
16/34, 2,980′x75′, paved (good), MIRL

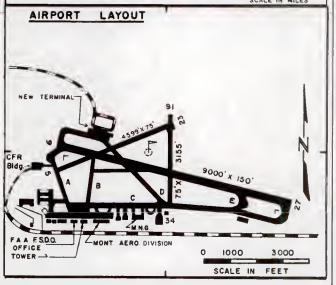
5/23, 4,600′x75′, paved (good)

Taxiway Data: All taxiways are paved (good)

Apron Data: Commercial, paved (good); GA, paved (good)

Beacon: Yes Nav. Aids: VOR 117.7
NDB 386
Control Tower





RECOMMENDED IMPROVEMENTS

The following recommendations were developed from discussions with Ron Mercer:

	COSTS
1989	
o Construct an air-freight ramp	$450,000*
o Establish customs service and become a customs port	(Cost unknown)
1990	
o Develop additional T-hangar space by adding 16 to 24 hangars	$360,000
o Construct several large hangars	500,000
o Relocate Corporate Air facility to east end of the field	(Cost unknown)
o Upgrade the vehicle access to the airport on Washington St. (Possible cost share with the City.)	(Cost unknown)*
1992	
o Expand FAA facilities	(Cost unknown)*
o Expand rental car facilities	$ 80,000
o Install glide slope indicators and MIRL on runway 5/23	78,000*
o Construct 85′ control tower and install terminal radar service	(Cost unknown)*
o Construct subsurface storm drainage system	750,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
1995	
o Widen access road and circulation loop for the terminal building	$250,000*
o Rehabilitate runway 9/27	686,000*
1996	
o Rehabilitate runways 5/23 and 16/34	$294,000*
1997	
o Rehabilitate all taxiways and the GA apron area	$580,000*
2005	
o Rehabilitate runway 9/27	$686,000*
2006	
o Rehabilitate runways 5/23 and 16/34	$294,000*
2007	
o Rehabilitate all taxiways and the GA apron area	$580,000*

*Project may be eligible for FAA matching funds.

City: **HINSDALE**

Airport Name: **HINSDALE**

County: Valley

Elev: 2,220'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

Operations: 600 720

Runway Data: 10/28, 2,250'x200', turf (good)

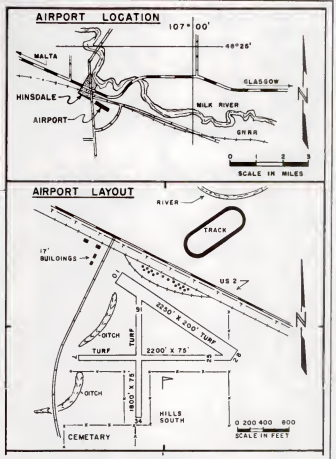
7/25, 2,200'x75', turf (good) LIRL (on request)

16/34, 1,800'x75', turf (good)

Taxiway Data: Turf

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The facility should be operated and maintained as a VFR use only airport.

COSTS

City: **HOGELAND**

Airport Name: **HOGELAND**

County: Blaine

Elev: 3,150'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

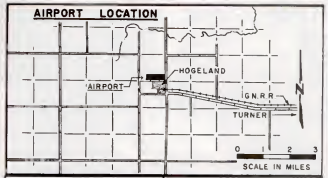
Operations: 400 480

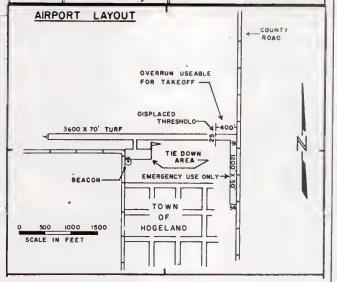
Runway Data: 7/25, 3,600'x70', turf (poor)
16/34, 1,200'x50', turf (emergency use only)

Taxiway Data: Turf

Apron Data: Turf

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

1989

Beacon use should be discontinued to discourage night-time operations.

Perimeter fencing should be installed.

The facility should be maintained for VFR-daylight use only.

COSTS

$16,000

City: **HOT SPRINGS**

Airport Name: **HOT SPRINGS**

County: Sanders

Elev: 2,763'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

Operations: 400 480

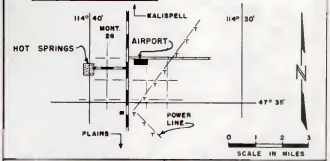
Runway Data: 6/24, 2,500'x75', gravel (fair), MIRL

Taxiway Data: gravel (fair)

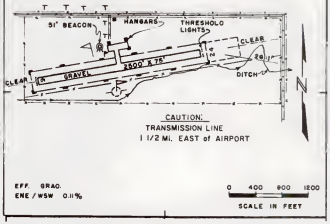
Apron Data: Gravel (fair)

Beacon: Yes Nav. Aids: No

AIRPORT LOCATION



AIRPORT LAYOUT



RECOMMENDED IMPROVEMENTS

This airport should continue to be operated as a public-use facility.

COSTS

City: **HYSHAM**

Airport Name: **HYSHAM**

County: Treasure

Elev: 2,624'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

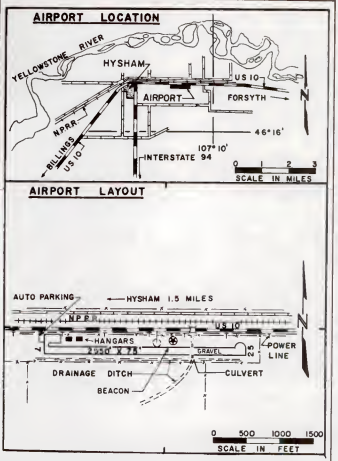
Operations: 600 720

Runway Data: 7/25, 2,950'x75', gravel (poor), LIRL

Taxiway Data: Gravel (poor)

Apron Data: Gravel (fair)

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

COSTS

1989

Grade and roll runway to produce a firm, smooth surface. $2,000

The facility should continue to be operated and maintained as a public-use airport.

City: **JORDAN**

Airport Name: **JORDAN**

County: Garfield

Elev: 2,662′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

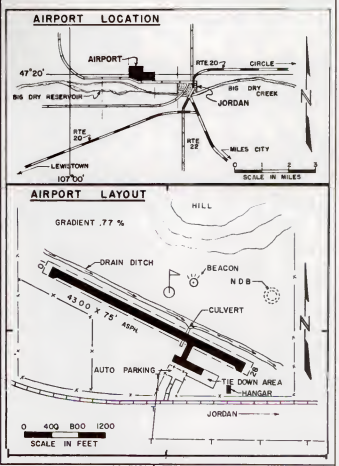
Operations: 2,000 2,400

Runway Data: 10/28, 4,300′x75′, paved (poor), MIRL, VASI on 28

Taxiway Data: 95′x30′, paved (poor)

Apron Data: 100′x300′, paved (poor), 9 tie-downs

Beacon: Yes Nav. Aids: NDB 263



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1978.

1992

All paved areas should be rehabilitated. Runway safety areas should be improved.

2002

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$200,000*

$185,000*

City: **KALISPELL**

Airport Name: **KALISPELL CITY FIELD**

County: Flathead

Elev: 2,935′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	54	66
Multi Engine:	3	2
Other:	2	2

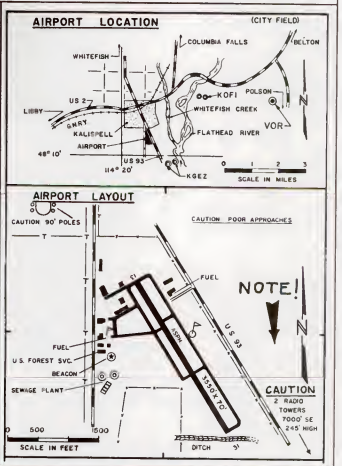
Operations: 12,825 15,390

Runway Data: 13/31, 3,600′x70′, paved (good), LIRL

Taxiway Data: 5,950′x20′, paved (good)

Apron Data: 65 tie-downs on turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1984.

1989

This airport should be examined to determine if it can be added to the NPIAS.

The two radio towers located 7,000′ southeast of the airport should be relocated. Land should be acquired, and the runway extended to a BUII length (4,300′x70′) complete with MIRL system and approach glide slope indicators. Widen taxiways to 30′ and construct a paved apron (10,000 sy).

COSTS

$587,000

2000

Rehabilitate all paved areas.

$290,000

City: **KALISPELL**

Airport Name: **GLACIER PARK INT'L.**

County: Flathead

Elev: 2,972'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	36	45
Multi Engine:	13	13
Turbojet:	0	1
Other:	1	1

Operations: 41,030 65,250

Runway Data: 1/19, 8'000x150', paved (good), HIRL, REIL on 19, VASI4 on 19, MALSR on 01, ILS on Runway 1.

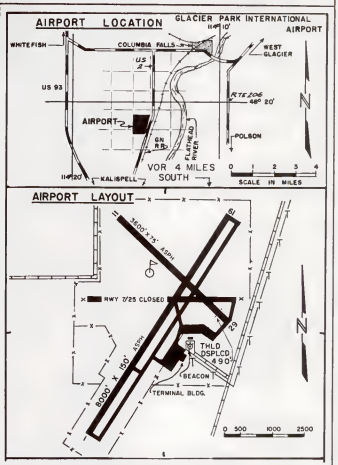
11/29, 3,600'x75', paved (very good), PAPI on 29

Taxiway Data: 8,000'x50', paved (good)
400'x60', paved (good)
(4) 300'x50', paved (good)
450'x35', paved (good)

Apron Data: 21,312 sy GA, 16,806 sy airline, paved (good)

Beacon: Yes

Nav. Aids: VOR 108.4
ND8 515



RECOMMENDED IMPROVEMENTS

The following recommended improvements are from the Airport Master Plan.

1988-1992 - Phase I

- o Relocate fuel farm and construct access road.
- o Remove buildings from the General Aviation area.
- o Acquire land, north end.
- o Construct gravel airport frontage road.
- o Construct rental car service area.
- o Construct runway visual range (RVR) indicator.
- o Develop central water system.
- o Construct corporate hangar and T-hangar access taxiway.
- o Construct additional T-hangars.
- o Construct General Aviation apron area - north side.

COSTS

$ 2,835,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
1993-1997 - Phase II	
o Install PAPI on Runway 1. o Acquire land - south end. o Pave airport frontage road. o Construct terminal second level jetway. o Redevelop airport entrance and access road. o Install apron security lighting. o Construct central wastewater system. o Expand General Aviation apron and access taxiways. o Construct security fence. o Construct U.S. Forest Service apron - north end. o Construct additional T-hangars. o Construct FBO terminal building (General Aviation). o Construct apron for heavy charter. o Develop agricultural applicator operation area. o Remove and recycle Runway 25 pavement.	$ 2,610,000*
1998-2007 - Phase III	
o Extend Runway 1/19. o Overlay Runway 1/19 and parallel taxiway, widening, lights. o Expand terminal building. o Expand terminal apron. o Expand terminal auto parking lot. o Light Runway 11/29 and construct parallel taxiway. o Expand General Aviation aprons and taxi lanes - north side. o Construct additional T-hangars. o Construct central air parcel/cargo facility. o Install runway surface condition scanner equipment.	$ 8,385,000*
TOTAL ALL PHASES:	$13,840,000*

*Portions of these projects may be eligible for FAA matching funds.

City: **LAUREL**

Airport Name: **LAUREL MUNICIPAL**

County: Yellowstone

Elev: 3,515′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	58	70
Multi Engine:	3	4
Rotocraft:	1	1
Other:	3	3

Operations: 18,000 21,600

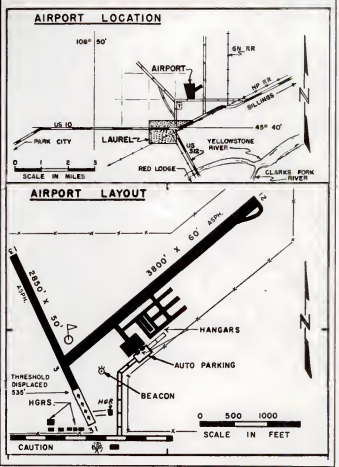
Runway Data: 3/21, 3,800′x60′, paved (fair), MIRL, VASI on 21

13/31, 2,850′x50′, paved (poor)

Taxiway Data: 3,800′x50′, paved (fair)

Apron Data: 450′x250′, paved (fair)

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1978.

1989

Rehabilitate, widen, and extend 3/21; improve safety areas. — $650,000*

1995

Rehabilitate 13/31. — $100,000*

1999

Rehabilitate 3/21, taxiways, and apron areas. — $447,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **LAVINA**

Airport Name: **LAVINA**

County: Golden Valley

Elev: 3,490'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

Operations: 120 144

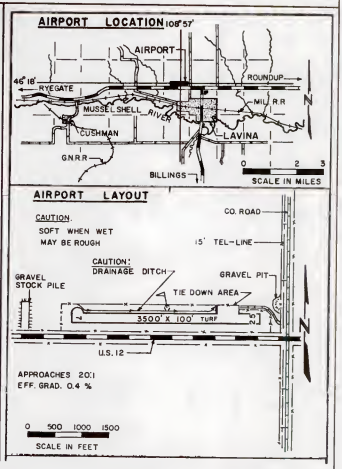
Runway Data: 7/25, 3,500'x100', turf (fair)

Taxiway Data: None

Apron Data: Turf (fair)

Beacon: No

Nav. Aids: No



RECOMMENDED IMPROVEMENTS

Golden Valley County has returned ownership of this airport back to the State. The State should evaluate the benefits and associated operational costs to determine if this airport should remain open. If the airport remains open, it should be restricted to VFR-daylight use only.

COSTS

City: **LEWISTOWN**

Airport Name: **LEWISTOWN**

County: Fergus

Elev: 4,167′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	23	28
Multi Engine:	2	3
Rotocraft:	4	4

Operations: 20,200 28,100

Runway Data: 7/25, 5,390′x100′, paved (very good), MIRL, VASI, and REIL on both ends, NPI

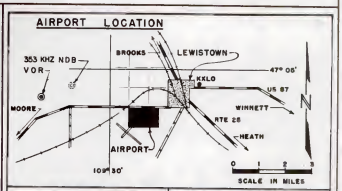
2/20, 5,800′x100′, paved (fair), MIRL

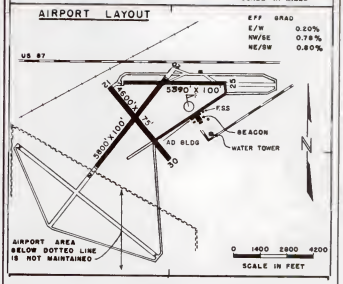
12/30, 4,600′x75′, paved (poor)

Taxiway Data: 4,400′x75′, paved (good)

Apron Data: 15,278 sy plus 11,111 sy, paved (fair)

Beacon: Yes Nav. Aids: VOR 112.0 NDB 353





RECOMMENDED IMPROVEMENTS

The last major projects were: 2/20, 1978; 7/25, 1985; 12/30, 1987; taxiway, 1980; and apron, 1980.

1989

Extend 7/25; rehabilitate 2/20, the taxiways, and apron area. Construct a new water system to serve the airport. — $1,015,000*

1995

Runways 12/30 and 7/25 should be rehabilitated. — $ 615,000*

2000

Runway 2/20, the taxiway, and apron area should be rehabilitated. — $ 403,000*

2005

Runways 12/30 and 7/25 should be rehabilitated. — $ 615,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **LIBBY**

Airport Name: **LIBBY**

County: Lincoln

Elev: 2,600′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	15	17
Multi Engine:	0	1
Other:	2	2

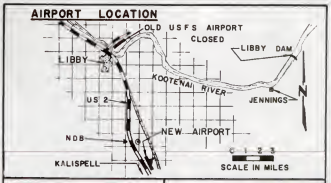
Operations: 4,125 4,950

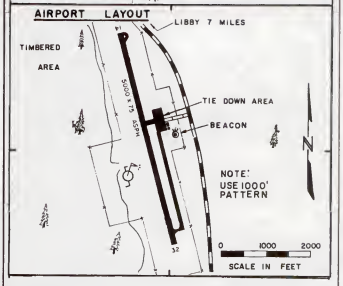
Runway Data: 14/32, 5,000′x75′, paved (very good), MIRL, PAPI on both ends

Taxiway Data: 200′x35′, paved (very good) (2,100′x35′) Partial parallel taxiway, paved (very good)

Apron Data: 10,000 sy, paved (very good), 15 tie-downs

Beacon: Yes Nav. Aids: NDB 414





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1995

All paved areas should be rehabilitated. $327,000*

2005

All paved areas should be rehabilitated. $327,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **LINCOLN**

Airport Name: **LINCOLN**

County: Lewis & Clark

Elev: 4,597′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	4	5
Multi Engine:	0	0

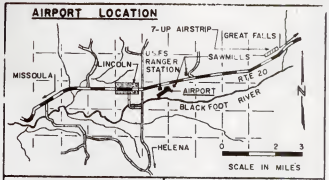
Operations: 2,000 2,400

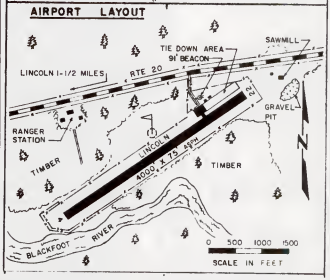
Runway Data: 4/22, 4,000′x75′, paved (fair)

Taxiway Data: 105′x30′, paved (fair)

Apron Data: 150′x200′, paved (fair)

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1989

This airport is currently owned by the Montana Aeronautics Division. The State should transfer rights and responsibilities for the airport to Lewis and Clark County or the USFS. The airport should be operated as a VFR-daylight use only airport.

If the ownership is not transferred, the State should establish an airport-use fee system that will generate the necessary revenue to cover the cost of insuring, operating, and maintaining the facility.

1995

All paved areas should be rehabilitated. $172,000*

2005

All paved areas should be rehabilitated. $172,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **LIVINGSTON**

Airport Name: **LIVINGSTON**

County: Park

Elev: 4,656'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	18	21
Multi Engine:	1	2

Operations: 5,125 6,150

Runway Data: 4/22, 5,700'X75', paved (good), MIRL, REIL on 22, VASI on 22

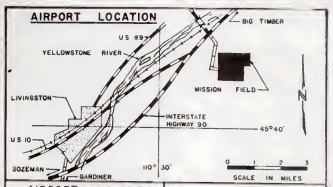
8/26, 3,700'x300' turf (good)

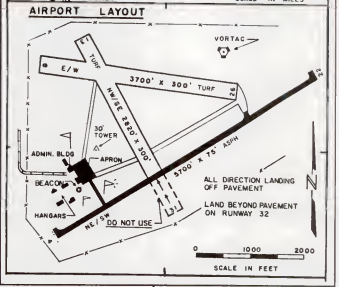
13/31, 2,820'x300', turf (good)

Taxiway Data: 595'x50', paved (good)

Apron Data: 325'x230', 8,306 sy paved (good)

Beacon: Yes Nav. Aids: VOR 116.1





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1984.

1994

All paved areas should be rehabilitated.

2004

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$273,000*

$273,000*

City: MALTA

Airport Name: MALTA

County: Phillips

Elev: 2,280′ **NPIAS:** Yes

Based Aircraft:	1987	2005
Single Engine:	22	26
Multi Engine:	1	1
Rotocraft:	1	2

Operations: 6,650 7,980

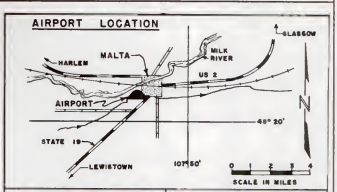
Runway Data: 7/25, 3,600′x75′, paved (fair), MIRL

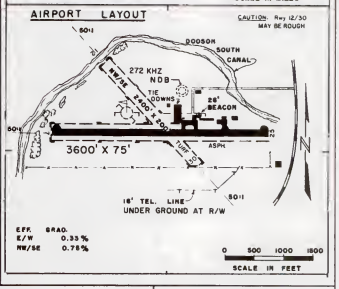
12/30, 2,400′x200′, turf (poor)

Taxiway Data: 120′x30′, paved (fair)
120′x30′, paved (fair)
240′x30′, paved (poor)

Apron Data: 184′x73′, paved (fair), 12 tie-downs

Beacon: Yes **Nav. Aids:** NDB 272





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1977.

1992

All paved areas should be rehabilitated.

Construct new taxiway; remove obstructions; and install a glide slope indicator on 25.

2001

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$230,000*

$165,000*

City: **MEADOW CREEK**

Airport Name: **MEADOW CREEK (USFS)**

County: Flathead

Elev: 3,984′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

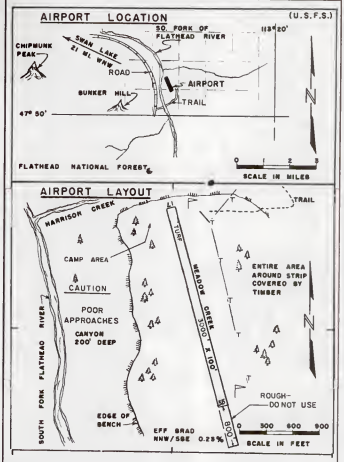
Operations: 125 150

Runway Data: 17/35, 3,000′x100′, turf (good)

Taxiway Data: None

Apron Data: None

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

Improve turf strip by trimming back trees and brush on field and filling rodent holes and other depressions. Cut all trees that penetrate 20:1 approach surfaces.

Maintain as VFR-daylight use only facility.

COSTS

$5,000

City: **MILES CITY**

Airport Name: **FRANK WILEY FIELD**

County: Custer

Elev: 2,628′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	33	40
Multi Engine:	2	2

Operations: 20,000 25,500

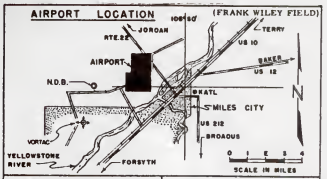
Runway Data: 4/22, 5,783′x100′, paved (good), MIRL, VASI both ends, REIL on 4

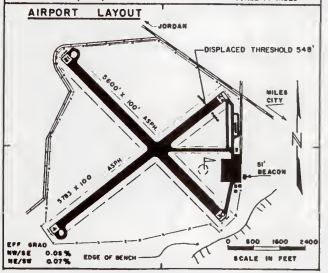
12/30, 5,600′x100′, paved (good), MIRL, VASI both ends, REIL on 30

Taxiway Data: 250′x50, paved (good)
700′x50′, paved (good)
675′x50′, paved (good)

Apron Data: 4,211 sy, paved (good)

Beacon: Yes Nav. Aids: VOR 112.1
NDB 320





RECOMMENDED IMPROVEMENTS

The last major project was done in 1986.

1989

Relocate county road and perimeter fence around the 12 end of Runway 12/30 to improve the safety area.

Acquire additional snow removal equipment.

1996

All paved areas should be rehabilitated.

2006

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$100,000*

$643,000*

$643,000*

City: **MISSOULA**

Airport Name: **JOHNSON-BELL FIELD**

County: Missoula

Elev: 3,201′ NPIAS: Yes

Based Aircraft:

	1987	2005
Single Engine:	119	120
Multi Engine:	12	36
Turbojet:	3	4
Rotocraft:	4	5
Other:	1	2

Operations: 66,548 92,250

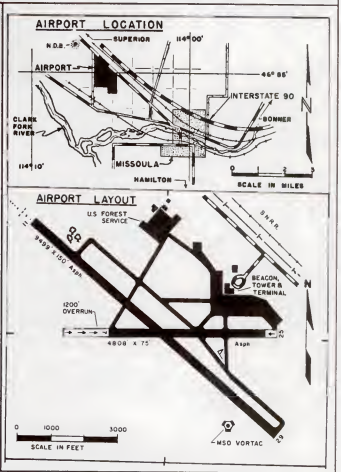
Runway Data: 11/29, 9,499′x150′, paved (good), HIRL, ILS on 11 and 29, MALSR on 11, REIL and VASI on 29

7/25, 4,808′x75′, paved (very good)

Taxiway Data: All paved (good), 122,800 sy

Apron Data: 90,160 sy GA, 47,192 sy airline, paved (good)

Beacon: Yes Nav. Aids: VOR 112.8
NDB 308
Control Tower



RECOMMENDED IMPROVEMENTS

Terminal radar service is scheduled to be installed in 1990.

The following recommendations were taken from the airport's Master Plan:

- To achieve full ownership of the clear zone and to ensure land use compatibility, 405 acres of land at the southeastern end of Runway 11/29 should be acquired.
- Ninety-five acres of land to the west of Runway 7/25 should be acquired to maintain the capability of extending the runway length by 2,000′.
- A taxiway parallel to and south of Runway 7/25 should be constructed, and Taxiway P should be extended to the northwest threshold of Runway 11/29.
- The terminal complex should be retained in its existing location and the passenger terminal building expanded to provide five major airline aircraft and four commuter airline aircraft parking positions and space to accommodate the needs for ticketing, rental cars, baggage make-up and claim, concessions, and other building functions. The major airline expansion should be in the westerly

COSTS

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
direction and the commuter airline expansion in the easterly direction. Sufficient space should be provided adjacent to the terminal complex to allow for expansion beyond the year 2005 requirements to ensure the longevity of the complex at its existing site.	
o The terminal loop road should be redesigned to provide sufficient parking at grade in front of the passenger terminal building.	
o Development of a roadway interchange with Interstate 90 is encouraged to provide closer highway access to the airport.	
o General aviation basing facilities need to be concentrated at the east end of Runway 7/25 by retaining the existing executive hangar area to the north of the runway and developing a new general aviation area to the south of the runway. Over time, new taxiway and aircraft parking apron facilities should be constructed to accommodate general aviation uses. New crash/fire/rescue building and garage/airport maintenance building could be located to the southwest of the terminal complex.	
o An area adjacent to the U.S. Forest Service Aerial Fire Depot facility should be provided for their use for a new aircraft parking apron.	
o Reserve the strip of land to the west of the U.S. Forest Service Aerial Fire Depot for commercial and industrial uses.	$22,900,000*
*Certain projects may be eligible for FAA matching funds.	

City: **MORGAN**

Airport Name: **MORGAN**

County: Phillips

Elev: 2,813'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

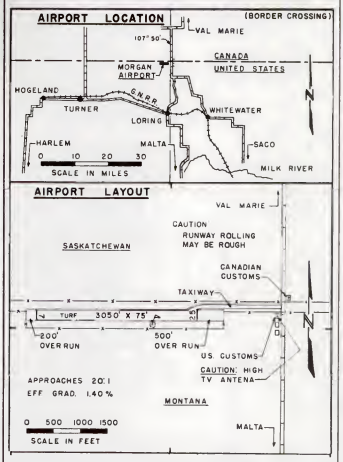
Operations: 200 240

Runway Data: 7/25, 3,050'x75', turf (fair)

Taxiway Data: 20' wide, dirt

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The existing facility should be maintained and operated as a VFR-daylight use only airport.

COSTS

City: **OPHEIM**

Airport Name: **OPHEIM**

County: Valley

Elev: 3,264′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	1	1
Multi Engine:	0	0

Operations: 300 360

Runway Data: 16/34, 2,700′x200′, turf (good), LIRL

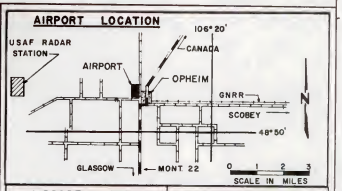
10/28, 1,230′x100′, turf (fair)

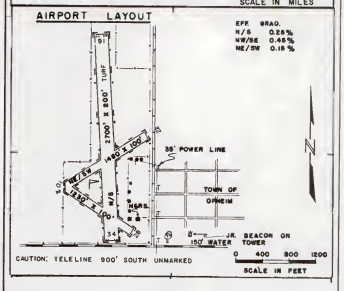
4/22, 1,480′x100′, turf (fair)

Taxiway Data: Turf

Apron Data: Turf

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

This airport should continue to be operated and maintained as a public use facility.

COSTS

City: **PHILIPSBURG**

Airport Name: **RIDDICK FIELD**

County: Granite

Elev: 5,212′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	7	8
Multi Engine:	0	0

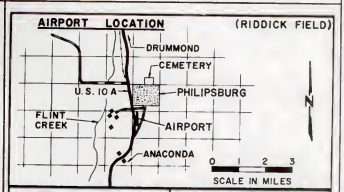
Operations: 2,225 2,670

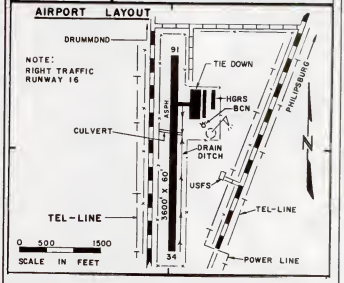
Runway Data: 16/34, 3,600′x60′, paved (good), MIRL

Taxiway Data: 225′x30′, paved (good)

Apron Data: 150′x200′, paved (good), 3 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1983.

1993

Rehabilitate and extend 16/34; install glide slope indicators; and improve safety areas.

2003

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$350,000*

$135,000*

City: **PLAINS**

Airport Name: **PLAINS**

County: Sanders

Elev: 2,462'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	5	6
Multi Engine:	0	0

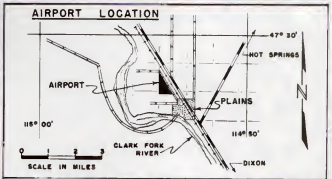
Operations: 2,025 2,430

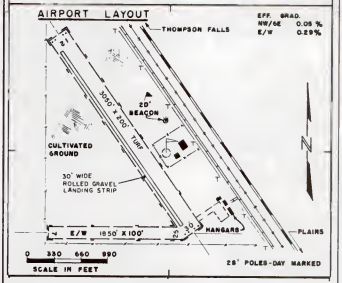
Runway Data: 12/30, 3,050'x200', turf (good), LIRL

Taxiway Data: 300'x50', turf (good)

Apron Data: Turf

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

1994

Conduct a Master Plan and develop airport to the standards outlined in the Plan.

2004

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$700,000*

$135,000*

City: **PLENTYWOOD**

Airport Name: **SHER-WOOD**

County: Sheridan

Elev: 2,250′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	26	31
Multi Engine:	0	0

Operations: 6,600 7,920

Runway Data: 12/30, 3,900′x75′, paved (very good), MIRL

7/25, 2,100′x75′, turf (poor)

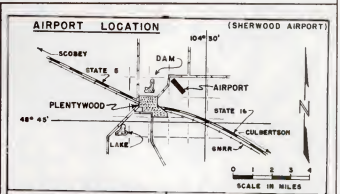
4/22, 1,600′x75′, turf (poor)

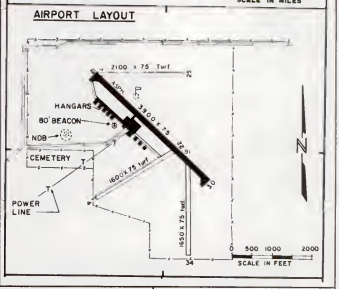
16/34, 1,650′x75′, turf (good)

Taxiway Data: 1,100′x30′, paved (good)
1,100′x40′, paved (good)
500′x24′, paved (good)

Apron Data: 417′x179′, paved (very good), 10 tie-downs

Beacon: Yes Nav. Aids: NDB 251





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1984.

1990

All paved areas should be rehabilitated and a partial parallel taxiway constructed.

2000

The runway, connecting taxiways, and apron area should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$500,000*

$215,000*

City: **POLSON**

Airport Name: **POLSON**

County: Lake

Elev: 2,932′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	16	19
Multi Engine:	1	1

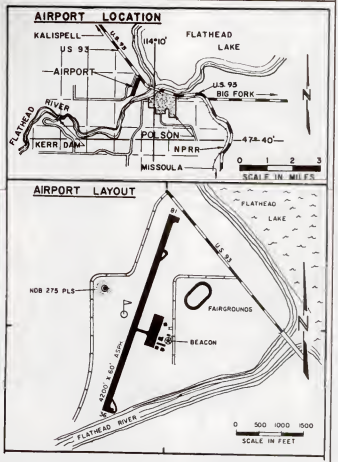
Operations: 5,125 6,150

Runway Data: 18/36, 4,200′x60′, paved (fair), MIRL, VASI on 36

Taxiway Data: 250′x40′, paved (fair)

Apron Data: 660′x175′, paved (fair), 26 tie-downs

Beacon: Yes Nav. Aids: NDB 275



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1983.

1993

The MIRL should be rehabilitated and the apron area expanded. The safety areas should be improved.

All paved areas should be rehabilitated.

COSTS

$310,000*

2003

All paved areas should be rehabilitated.

$200,000*

*Project may be eligible for FAA matching funds.

City: **POPLAR**

Airport Name: **POPLAR**

County: Roosevelt

Elev: 2,006′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	6	7
Multi Engine:	1	1

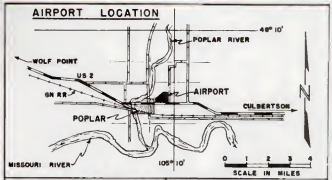
Operations: 2,875 3,450

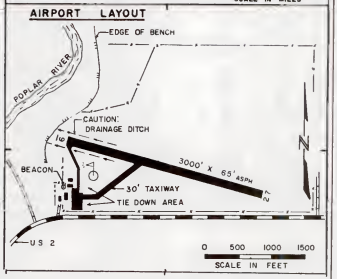
Runway Data: 9/27, 3,000′x60′, paved (good), MIRL, VASI on 27

Taxiway Data: 972′x30′, paved (good)
862′x30′, paved (good)

Apron Data: 7,299 sy, paved (good), 10 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1985.

1995

All paved areas should be rehabilitated. $154,000*

2005

All paved areas should be rehabilitated. $154,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **RED LODGE**

Airport Name: **RED LODGE**

County: Carbon

Elev: 5,763′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	10	11
Multi Engine:	0	1

Operations: 3,050 3,660

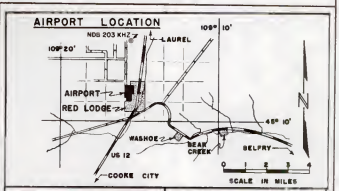
Runway Data: 16/34, 4,000′x75′, paved (good), MIRL, non-standard markings, VASI on 16

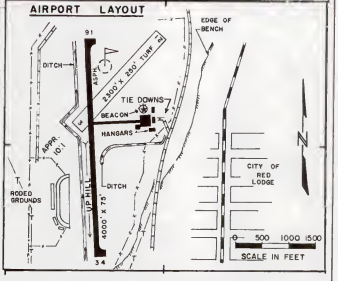
3/21, 2,300′x250′, turf (poor 5010)

Taxiway Data: 860′x40′, paved (good)

Apron Data: 3,333 sy, paved (fair, 8 tie-downs

Beacon: Yes Nav. Aids: NDB 203





RECOMMENDED IMPROVEMENTS

Runway 16/34 was reconstructed in 1980 under a 1978 FAA grant. Unfortunately, residential housing has been allowed to develop north of the airport which prevents extending runway 16/34 to a BUI length of 5,000′.

1995

Rehabilitate all paved areas. The trees penetrating the 20:1 approach surface on 03 should be removed. The runway safety areas should be improved.

$189,000*

1998

A site-relocation study should be conducted to determine the feasibility of and the need for a BUI length runway on another site.

$ 30,000*

2005

If relocation of the airport is necessary, construct a new facility at the approved site ($1,000,000). If not, maintain the existing facility. All paved areas should be rehabilitated.

$183,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **RICHEY**

Airport Name: **RICHEY**

County: Dawson

Elev: 2,493′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	5	6
Multi Engine:	0	0

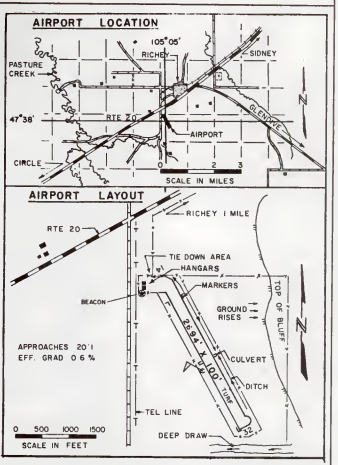
Operations: 1,225 1,470

Runway Data: 14/32, 2,694′x100′, turf (fair), LIRL

Taxiway Data: Turf (fair)

Apron Data: Turf (fair)

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The existing facility should be maintained.

COSTS

City: **RONAN**

Airport Name: **RONAN**

County: Lake

Elev: 3,089'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,900 3,480

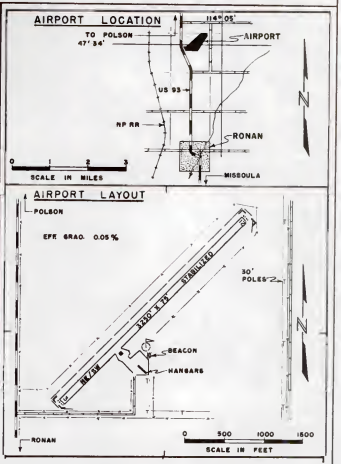
Runway Data: 3/21, 3,250'x75', turf-gravel (poor), LIRL

(Airport improvement project underway 1988/1989)

Taxiway Data: Turf

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

	COSTS
1989	
Complete the continuing airport construction project.	$300,000*
1999	
All paved areas should be rehabilitated.	$140,000*

*Project may be eligible for FAA matching funds.

City: **ROUNDUP**

Airport Name: **ROUNDUP**

County: Musselshell

Elev: 3,485′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	10	12
Multi Engine:	0	0

Operations: 3,550 4,260

Runway Data: 6/24, 5,100′x75′, paved (very good), MIRL, PAPI on 24

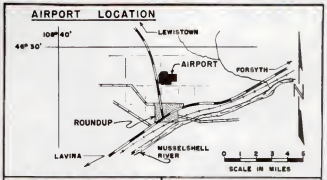
15/33, 2,600′x100′, turf (good)

Taxiway Data: 875′x30′, paved (very good)

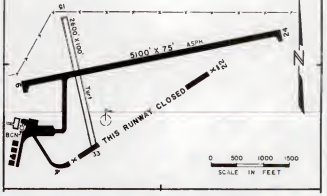
Apron Data: 100′x250′ and 200′x120′, 5,444 sy paved (very good)

Beacon: Yes Nav. Aids: NDB 362

AIRPORT LOCATION



AIRPORT LAYOUT



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1987.

1997

All paved areas should be rehabilitated.

2007

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$235,000*

$235,000*

City: **RYEGATE**

Airport Name: **RYEGATE**

County: Golden Valley

Elev: 3,700′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

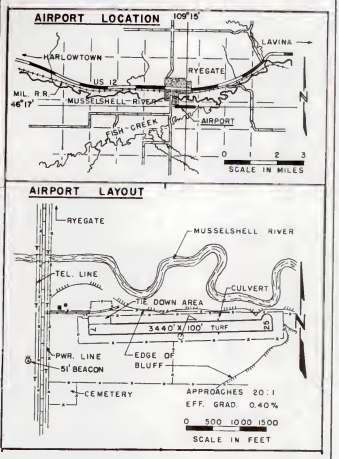
Operations: 150 180

Runway Data: 7/25, 3,440′x100′, turf (poor)

Taxiway Data: None

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

Golden Valley County has returned ownership of this airport back to the State. The State should evaluate the benefits and associated operating costs to determine if this airport should remain open. If the airport remains open, it should be restricted to VFR-daylight use only.

COSTS

City: **ST. IGNATIUS**

Airport Name: **ST. IGNATIUS**

County: Lake

Elev: 3,006′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

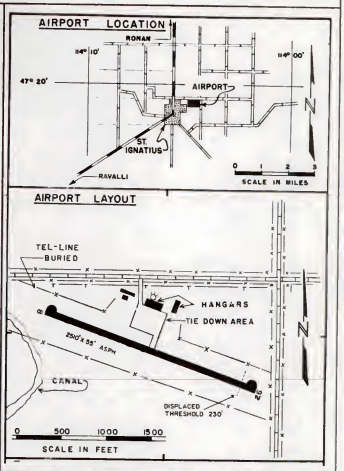
Operations: 1,675 2,010

Runway Data: 8/26, 2,510′x55′, paved (good), LIRL (1/2 of lights inoperative)

Taxiway Data: 75′x30′, paved (very poor)

Apron Data: Turf

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was in 1986.

1989

The obstructions that penetrate the 20:1 approach surfaces to the runway should be removed. The runway lights should be fixed, and the runway safety areas should be graded.

$17,000

1996

The runway should be rehabilitated. $75,000*

2006

The runway should be rehabilitated. $75,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **SCHAFER**

Airport Name: **SCHAFER MEADOWS (USFS)**

County: Flathead

Elev: 4,855′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

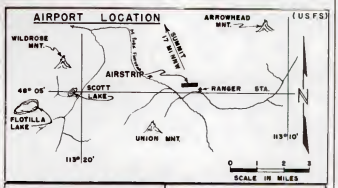
Operations: 175 210

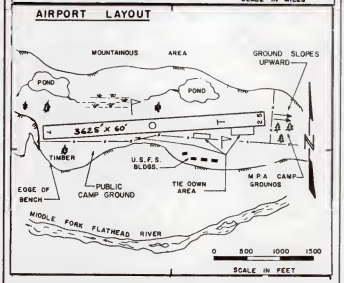
Runway Data: 7/25, 3,625′x60′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

Improve turf strip by trimming back trees and brush on the field and filling rodent holes and other depression. Cut all trees that penetrate 20:1 approach surfaces.

Maintain as VFR-daylight use only facility.

COSTS

$5,000

City: **SCOBEY**

Airport Name: **SCOBEY**

County: Daniels

Elev: 2,433′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	14	17
Multi Engine:	0	0

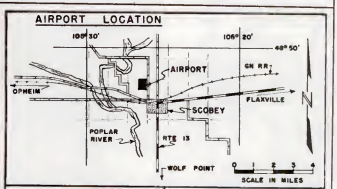
Operations: 3,950 4,740

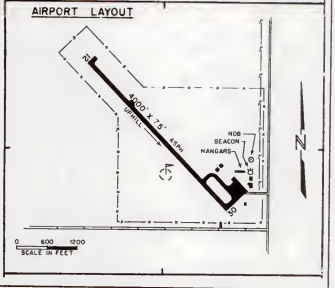
Runway Data: 12/30, 4,000′x75′, paved (very good), MIRL, PAPI on both ends

Taxiway Data: 775′x20′, paved (very good)

Apron Data: 220′x185′, paved (very good), 8 tie-downs

Beacon: Yes Nav. Aids: NDB 283





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1984.

1994

Rehabilitate all paved areas. — $185,000*

2004

Rehabilitate all paved areas. — $185,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **SEELEY LAKE**

Airport Name: **SEELEY LAKE**

County: Missoula

Elev: 4,235′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	2	2
Multi Engine:	0	0

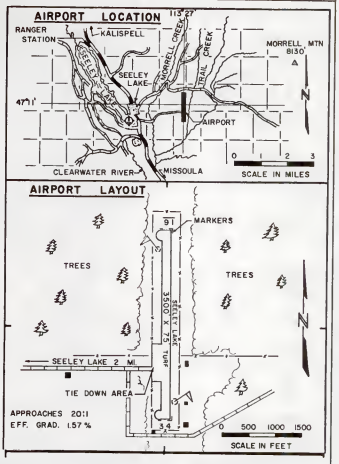
Operations: 1,350 1,620

Runway Data: 16/34, 3,500′x75′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The trees that penetrate the 20:1 runway approach surfaces should be removed.

COSTS

$2,000

City: **SHELBY**

Airport Name: **SHELBY**

County: Toole

Elev: 3,434'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	20	24
Multi Engine:	1	1

Operations: 5,975 7,170

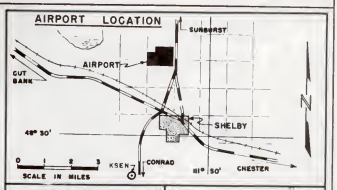
Runway Data: 5/23, 4,600'x75', paved (very good), MIRL, VASI on 23

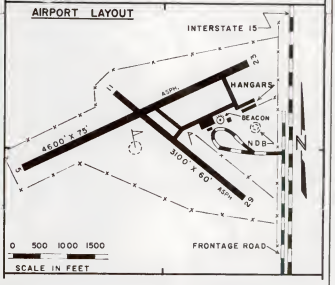
11/29, 3,100'x60', paved (very good), MIRL, VASI on 29

Taxiway Data: 1,920'x30', paved (very good)

Apron Data: 460'x175', paved (very good)
185'x50', paved (very good)

Beacon: Yes Nav. Aids: NDB 347





RECOMMENDED IMPROVEMENTS

The last major project was completed in 1986.

1989

Extend and rehabilitate 11/29; construct a parallel taxiway and improve the safety areas. — $500,000*

1996

Rehabilitate 5/23, taxiways, and apron area. — $280,000*

1999

Rehabilitate 11/29. — $120,000*

2006

Rehabilitate 5/23, taxiways, and apron area. — $280,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **SIDNEY**

Airport Name: **SIDNEY-RICHLAND MUNICIPAL (BURNS FIELD)**

County: Richland

Elev: 1,983'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	57	67
Multi Engine:	3	5
Rotocraft:	1	1

Operations: 25,000 43,800

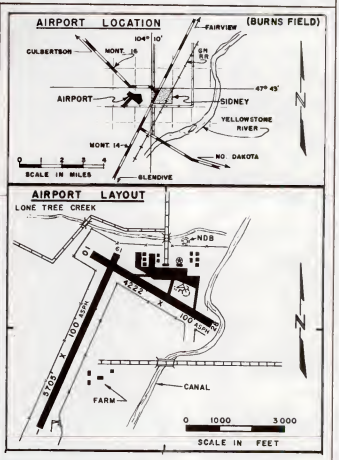
Runway Data: 1/19, 5,705'x100', paved (good), MIRL, VASI and REIL on 01, NPI on 1 and 19

10/28, 4,222'x100', paved (fair), MIRL, VASI and REIL on 28

Taxiway Data: 675'x50', paved (fair)
225'x50', paved (fair)
400'x50', paved (fair)

Apron Data: 32,222 sy, paved (fair), 34 tie-downs

Beacon: Yes Nav. Aids: NDB 359



RECOMMENDED IMPROVEMENTS

The last major projects were as follows: 1/19, 1984; 10/28, 1980; and apron, 1982.

A major maintenance project was performed in 1988; both runways were crack sealed.

1990

Runway 10/28 should be rehabilitated.

Land should be acquired for a taxiway expansion and Part 77 airspace requirements.

1994

Runway 1/19, all taxiways, and the apron area should be rehabilitated.

A parallel taxiway for 1/19 should be constructed, and the taxiway should be extended to the west to the new parallel taxiway.

COSTS

$247,000*

$848,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
2000	
Runway 10/28 should be rehabilitated.	$217,000*
2004	
Runway 1/29, all taxiways, and the apron area should be rehabilitated.	$470,000*
*Project may be eligible for FAA matching funds.	

City: **SPOTTED BEAR**

Airport Name: **SPOTTED BEAR (USFS)**

County: Flathead

Elev: 3,670'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

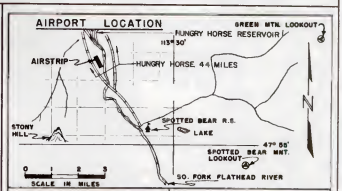
Operations: 150 180

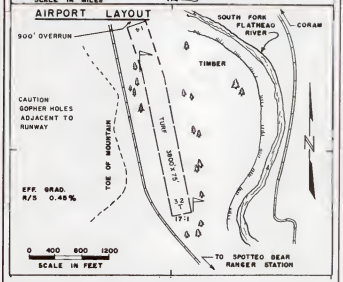
Runway Data: 14/32, 3,800'x75', turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

Improve strip by straightening out dog-leg alignment and by trimming trees and brush on field, filling rodent holes and other depressions, and roll field. Cut all trees that penetrate 20:1 approach surfaces.

Maintain as VFR-daylight use only facility.

COSTS

$5,000

City: **STANFORD**

Airport Name: **STANFORD**

County: Judith Basin

Elev: 4,318'

NPIAS: Yes

Based Aircraft:

	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,750 3,300

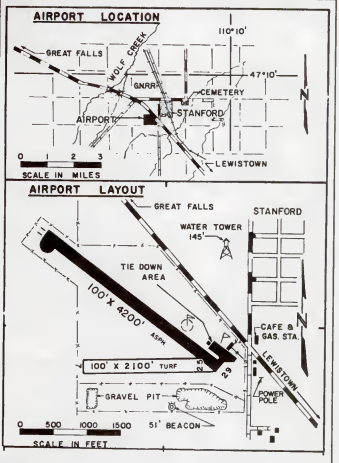
Runway Data: 11/29, 4,200'x100' paved (very good), MIRL, PAPI on 29

7/25, 2,280'x100', turf

Taxiway Data: 90'x30', paved (very good)

Apron Data: 7,222 sy, paved (very good), 5 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1986.

1996

All paved areas should be rehabilitated. — $250,000*

2006

All paved areas should be rehabilitated. — $250,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **STEVENSVILLE**

Airport Name: **STEVENSVILLE**

County: Ravalli

Elev: 3,620′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	20	24
Multi Engine:	0	0

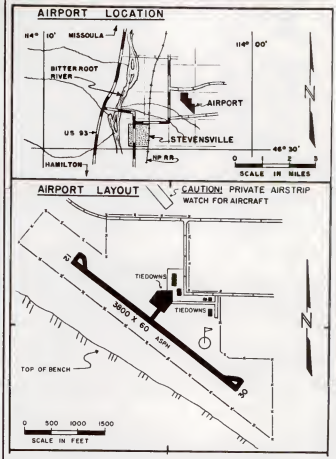
Operations: 4,950 5,940

Runway Data: 12/30, 3,800′x60, paved (good)

Taxiway Data: 180′x30′, paved (good)

Apron Data: 7,520 sy, paved (good)

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1980.

1989

The private strip to the north should be closed.

1992

All paved areas should be rehabilitated.

An airport lighting system with glide slope indicators should be installed. — $230,000*

2002

All paved areas should be rehabilitated. — $160,000*

*Project may be eligible for FAA matching funds.

City: **SUNBURST**

Airport Name: **SUNBURST**

County: Toole

Elev: 3,399′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

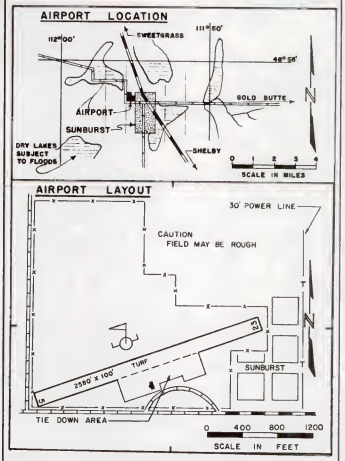
Operations: 200 240

Runway Data: 5/23, 2,580′x100′, turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The facility should be maintained as a VFR-daylight use only airport.

COSTS

City: **SUPERIOR**

Airport Name: **MINERAL COUNTY**

County: Mineral

Elev: 2,777'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	11	13
Multi Engine:	0	0

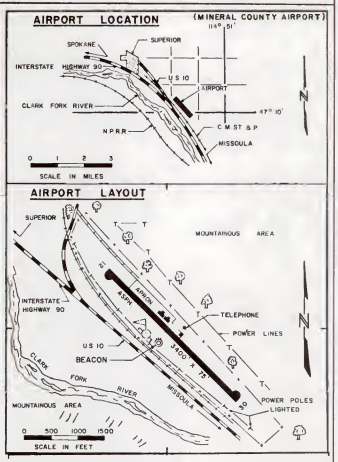
Operations: 3,275 3,930

Runway Data: 12/30, 3,400'x75', paved (very good), LIRL

Taxiway Data: 850'x25', paved (very good)

Apron Data: 255'x85' paved (very good), 6 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1986.

1996

All paved areas should be rehabilitated. — $153,000*

2006

All paved areas should be rehabilitated. — $153,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **SWEETGRASS**

Airport Name: **ROSS INT'L.**

County: Toole

Elev: 3,550′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

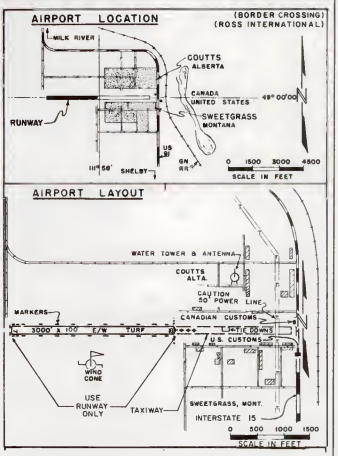
Operations: 200 240

Runway Data: 7/25, 3,000′x100′, turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

1989

This low-activity airport is currently operated by the Montana Aeronautics Division. The State should transfer the rights and responsibilities for the airport to Toole County. If not transferred, the State should evaluate the benefits and associated operational costs to determine if the facility should remain open. If the airport remains open and State-operated, a use fee should be established to generate the funds necessary to operate, insure, and maintain the airport.

COSTS

City: **TERRY**

Airport Name: **TERRY**

County: Prairie

Elev: 2,260′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	4	5
Multi Engine:	0	0

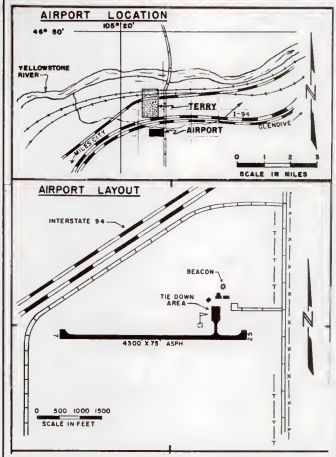
Operations: 1,850 2,220

Runway Data: 7/25, 4,300′x75′, paved (fair), MIRL

Taxiway Data: 282′x40′, paved (fair)

Apron Data: 121′x176′, paved (fair), 4 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1981.

1994

All paved areas should be rehabilitated. — $210,000*

2004

All paved areas should be rehabilitated. — $210,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **THOMPSON FALLS**

Airport Name: **THOMPSON FALLS**

County: Sanders

Elev: 2,460'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

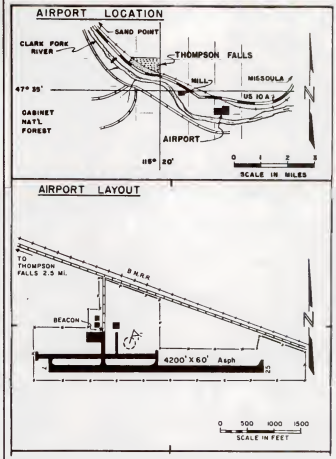
Operations: 1,525 1,830

Runway Data: 7/25, 4,200'x60', paved (very good), MIRL, VASI on 25

Taxiway Data: 2,580'x46', partial parallel, paved (good)

Apron Data: 121'x285', paved (good), 10 tie-downs

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1983.

1989

A security fence should be installed on the north side of the field. The shoulder area on the south side of the taxiway should be regraded to eliminate the sharp drop-off. — $ 5,000

1995

All paved areas should be rehabilitated. — $210,000*

2005

All paved areas should be rehabilitated. — $210,000*

*Project may be eligible for FAA matching funds.

City: **THREE FORKS**

Airport Name: **THREE FORKS**

County: Gallatin

Elev: 4,081′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	15	18
Multi Engine:	0	0
Other:	2	2

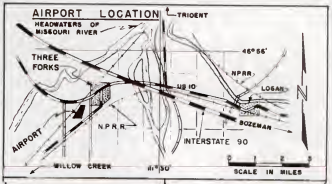
Operations: 4,125 4,950

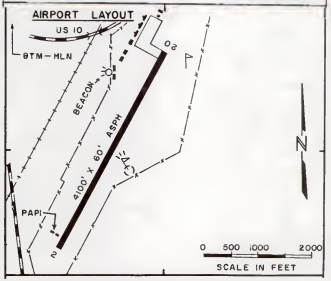
Runway Data: 2/20, 4,100′x60′, paved (very good), MIRL, PAPI on 2

Taxiway Data: 170′x35′, paved (very good)

Apron Data: 350′x180′, paved (very good), 14 tie-downs

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The runway, taxiway, and apron were constructed in 1986.

1996

All paved areas should be rehabilitated. — $163,000*

2006

All paved areas should be rehabilitated. — $163,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **TIBER DAM**

Airport Name: **TIBER DAM**

County: Liberty

Elev: 3,023′

NPIAS: No

Based Aircraft:

	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

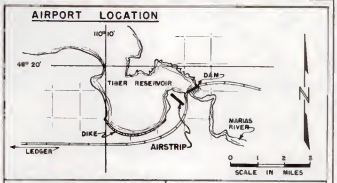
Operations: 200 240

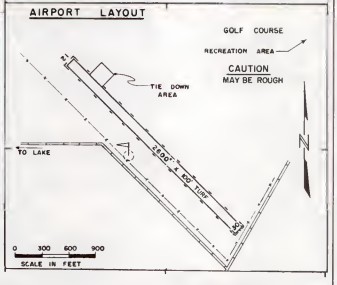
Runway Data: 12/30, 2,600′x100′, turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

The State operates and maintains this low-use airport. The State should evaluate the benefits and associated maintenance costs in determining if this airstrip should remain open.

COSTS

City: **TOWNSEND**

Airport Name: **TOWNSEND**

County: Broadwater

Elev: 3,900′ **NPIAS:** Yes

Based Aircraft:	1987	2005
Single Engine:	11	13
Multi Engine:	0	0

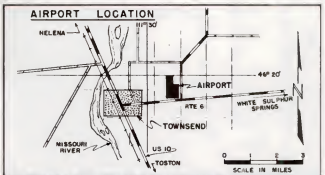
Operations: 3,275 3,930

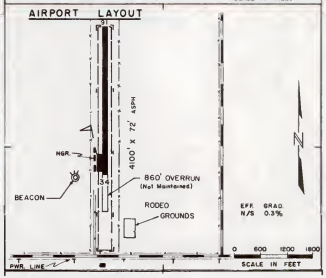
Runway Data: 16/34, 4,100′x72′, paved (fair), LIRL, non-standard markings

Taxiway Data: None

Apron Data: 6,600 sy, paved (fair), 5 tie-downs

Beacon: Yes **Nav. Aids:** No





RECOMMENDED IMPROVEMENTS

COSTS

1991

Master Plan study underway. Develop airport to the standards outlined in the Master Plan. — $760,000*

2001

All paved areas should be rehabilitated. — $150,000*

*Project may be eligible for FAA matching funds.

City: **TROY**

Airport Name: **TROY**

County: Lincoln

Elev: 2,017′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	1	1
Multi Engine:	0	0

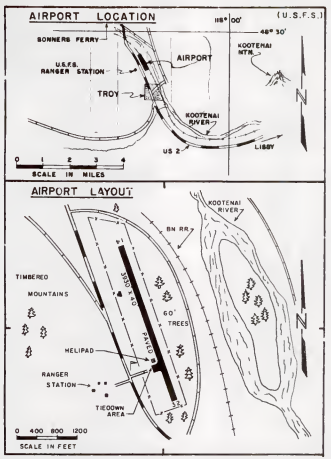
Operations: 500 600

Runway Data: 14/32, 3,930′x40′, paved (poor)

Taxiway Data: None

Apron Data: 40′x60′ paved (poor)

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

COSTS

The last major project was completed in 1984.

1989

The trees that penetrate the 20:1 runway approach surfaces should be cleared. $ 4,000

1994

All paved areas should be rehabilitated. $85,000

2004

All paved areas should be rehabilitated. $85,000

City: **TURNER**

Airport Name: **TURNER**

County: Blaine

Elev: 3,049′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	8	10
Multi Engine:	0	0

Operations: 2,750 3,300

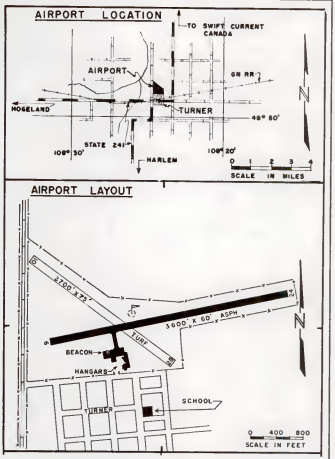
Runway Data: 6/24, 3,600′x60′, paved (fair), MIRL, PAPI-2 on 24

10/28, 2,700′x75′, turf

Taxiway Data: 210′x30′, paved (good)

Apron Data: 3,400 sy, paved (good)

Beacon: Yes Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The last major reconstruction project was in 1986.

1994

All paved areas should be rehabilitated.

The safety areas should be improved. $200,000*

2006

All paved areas should be rehabilitated. $200,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **TWIN BRIDGES**

Airport Name: **TWIN BRIDGES**

County: Madison

Elev: 4,772′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	5	6
Multi Engine:	0	0

Operations: 1,875 2,250

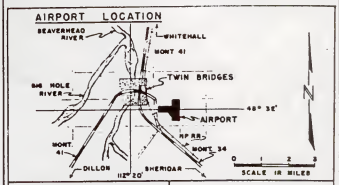
Runway Data: 16/34, 4,300′x60′, paved (very good), MIRL, PAPI

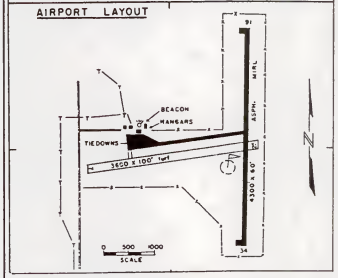
8/26, 3,400′x110′, turf

Taxiway Data: 2,200′x25′, paved (very good), MITL

Apron Data: 5,000 sy, paved (very good)

Beacon: Yes Nav. Aids: No





RECOMMENDED IMPROVEMENTS

NOTE: The airport data shown above reflects the improvements scheduled to be completed in 1988.

1988

Total reconstruction project, including:

- o Land acquisition
- o Paved runway (4,300′x60′)
- o Paved taxiway (2,200′x25′) (only a portion is FAA fundable)
- o Paved apron area (9,000 sy)
- o MIRL
- o Glide slope indicators
- o Beacon
- o Lighted wind cone
- o Fencing

COSTS

$600,000*

1989

The power line located off the end of 08 should be buried.

An antelope-proof fence should be constructed around the perimeter of the airport.

$ 30,000*

RECOMMENDED IMPROVEMENTS (CONT.)	COSTS
1998	
All paved areas should be rehabilitated.	$185,000*
2008	
All paved areas should be rehabilitated.	$185,000*
*Project may be eligible for FAA matching funds.	

City: **VALIER**

Airport Name: **VALIER**

County: Pondera

Elev: 3,820′ NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	9	11
Multi Engine:	1	1

Operations: 5,492 6,590

Runway Data: 7/25, 3,500′X300′, turf (good)

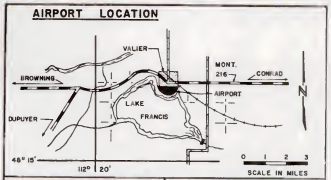
10/28, 3,000′x300′, turf (good)

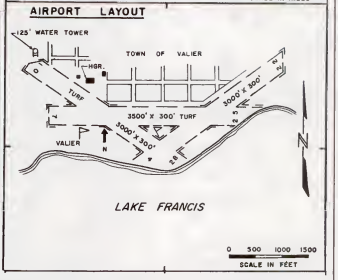
4/22, 3,000′x300′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

This site cannot meet BUI runway length requirements (3,900′), and relocation is unlikely. The airport should be maintained as a VFR-daylight use only facility.

COSTS

City: **WEST YELLOWSTONE**

Airport Name: **YELLOWSTONE**

County: Gallatin

Elev: 6,644′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0
Operations:	5,386	7,000

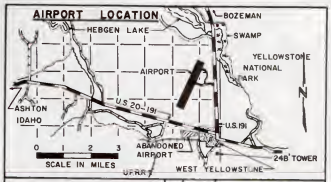
Runway Data: 1/19, 8,400′x150′, paved (very good), HIRL, ILS-MASLR on 01, VASI and REIL on 19

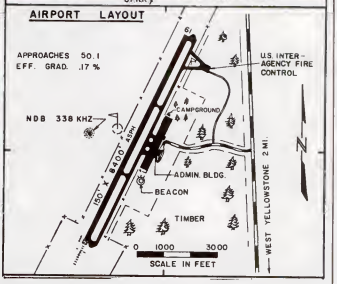
Taxiway Data: Full parallel taxiway, paved (very good)

Apron Data: 25,000 sy GA, 36,111 sy airline, paved (very good), 60 tie-downs

Beacon: Yes

Nav. Aids: NDB 338





RECOMMENDED IMPROVEMENTS

All paved areas were chip-sealed in 1981.

1989

Currently operated by Montana Aeronautics Division. The State should transfer ownership to City, County, USFS, or NPS. If not transferred, the State should continue to operate and maintain the existing facility. A fee structure for the use of the airport facilities should be established to provide the necessary revenues to operate, insure, and maintain them.

1991

All paved areas should be rehabilitated. — $503,000*

2001

All paved areas should be rehabilitated. — $503,000*

*Project may be eligible for FAA matching funds.

COSTS

City: **WHITEFISH**

Airport Name: **WHITEFISH**

County: Flathead

Elev: 3,063′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

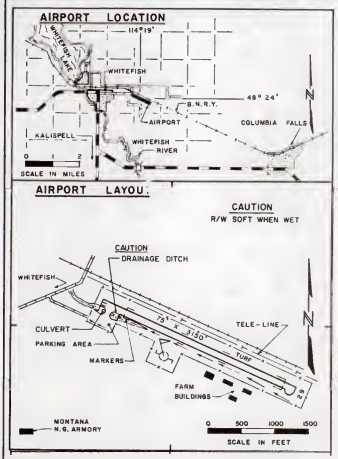
Operations: 500 600

Runway Data: 11/29, 3,150′x75′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

Evaluate lengthening 11/29 to 3,600′x75′ (turf) and removing the trees that penetrate 20:1 approach surfaces.

Maintain as VFR-daylight use only facility.

COSTS

$2,000

City: **WHITE SULPHUR SPRINGS**

Airport Name: **WHITE SULPHUR SPRINGS**

County: Meagher

Elev: 5,061′ **NPIAS:** Yes

Based Aircraft:

	1987	2005
Single Engine:	5	6
Multi Engine:	0	0

Operations: 2,025 2,430

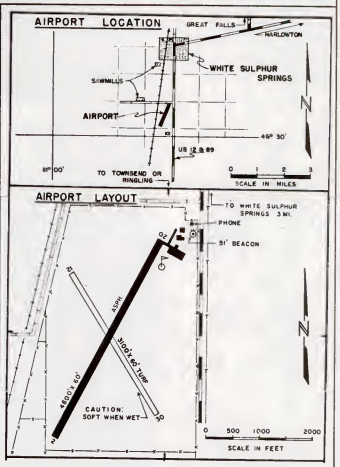
Runway Data: 2/20, 4,600′x60′, paved (good), MIRL

12/30, 3,100′x60′, turf (poor)

Taxiway Data: 40′x185′, paved (good)
20′x470′, paved (good)

Apron Data: 121′x165′, paved (good), 8 tie-downs

Beacon: Yes **Nav. Aids:** No



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1979.

1992

Rehabilitate all paved areas; expand the apron; install glide slope indicators and improve the safety areas.

2002

All paved areas should be rehabilitated.

*Project may be eligible for FAA matching funds.

COSTS

$340,000*

$180,000*

City: **WILSALL**

Airport Name: **WILSALL**

County: Park

Elev: 5,134′

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	1	1
Multi Engine:	0	0

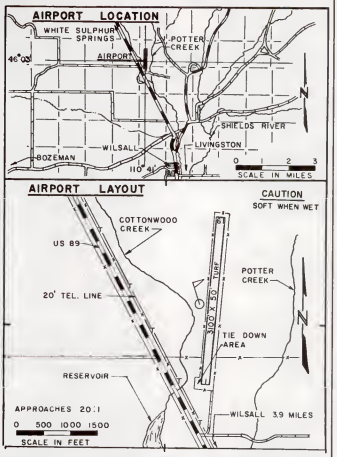
Operations: 275 330

Runway Data: 1/19, 3,100′x50′, turf (poor)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

The existing facility should be maintained and operated as a VFR-daylight use only airport.

COSTS

City: **WINIFRED**

Airport Name: **WINIFRED**

County: Fergus

Elev: 3,311′

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	3	4
Multi Engine:	0	0

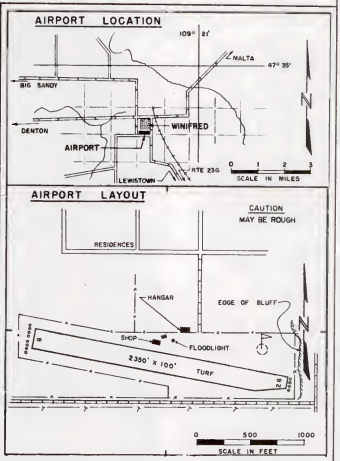
Operations: 700 840

Runway Data: 8/26, 2,350′x100′, turf (good)

Taxiway Data: None

Apron Data: Turf

Beacon: Yes (inoperative) Nav. Aids: No



RECOMMENDED IMPROVEMENTS

This low-activity airport has a turf runway that cannot be extended to meet BUI minimum length of 3,700′ and doesn′t justify relocation.

Maintain as a VFR-daylight use only facility.

COSTS

City: **WISDOM**

Airport Name: **WISDOM**

County: Beaverhead

Elev: 6,133′ NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

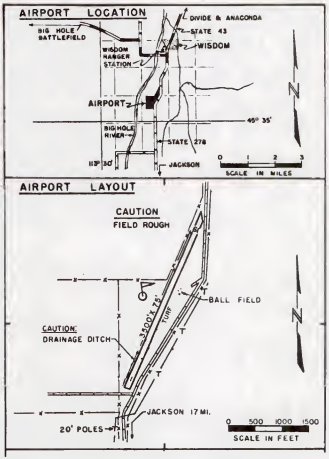
Operations: 60 72

Runway Data: 1/19, 3,500′x75′, turf (poor)

Taxiway Data: None

Apron Data: None

Beacon: No Nav. Aids: No



RECOMMENDED IMPROVEMENTS

This low-activity airport has a runway that cannot be extended to BUI length due to the State Highway located off the end of 19 and the county road off the end of 01.

Relocation of this airport is not justified; therefore, it is recommended this facility be maintained as a VFR-daylight use only airport.

COSTS

City: **WOLF CREEK**

Airport Name: **OXBOW RANCH**

County: Lewis & Clark

Elev: 3,635'

NPIAS: No

Based Aircraft:	1987	2005
Single Engine:	0	0
Multi Engine:	0	0

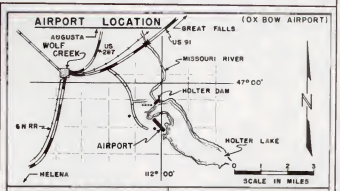
Operations: 150 180

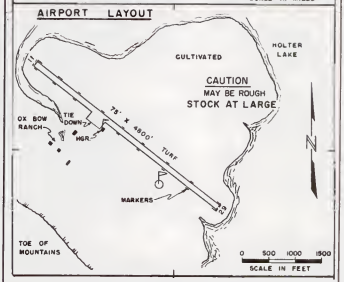
Runway Data: 11/29, 4,800'x75', turf (fair)

Taxiway Data: None

Apron Data: Turf

Beacon: No Nav. Aids: No





RECOMMENDED IMPROVEMENTS

1989

Currently, the State operates this low-activity airport. It is recommended the State not renew the lease on the property and transfer the airport back to the landowner.

COSTS

City: **WOLF POINT**

Airport Name: **WOLF POINT INT'L.**

County: Roosevelt

Elev: 1,986'

NPIAS: Yes

Based Aircraft:	1987	2005
Single Engine:	23	28
Multi Engine:	1	1

Operations: 10,250 13,000

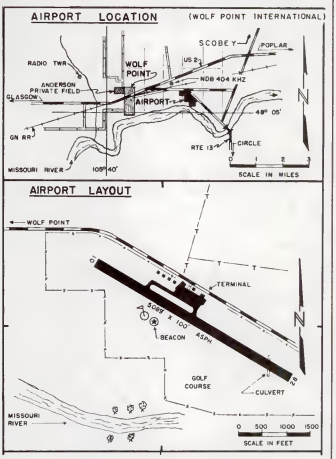
Runway Data: 10/28, 5,089'x100', paved (good), MIRL, VASI on both ends, REIL on 10

Taxiway Data: 970'x40', paved (good)
900'x25', paved (good)
300'x40', paved (good)

Apron Data: 300'x70', paved (good)
10,234 sy, paved (good)

Beacon: Yes

Nav. Aids: NOB 404



RECOMMENDED IMPROVEMENTS

The last major project was completed in 1983.

1993

A fence should be installed around the perimeter of the airport.

All paved areas should be rehabilitated. $390,000*

2003

All paved areas should be rehabilitated. $354,000*

*Project may be eligible for FAA matching funds.

COSTS

APPENDIX D: POPULATION STATISTICS BY COUNTY

County	1970 Population	1980 Population	Percent Change From 1970	July 1, 1986 Population Estimate	Percent Change From 1980	Projected 1990 Population	Projected 2000 Population	Percent Change From 1986
Beaverhead	8,817	8,186	0.0	8,500	3.3	8,200	8,300	- 2.4
Big Horn	10,057	11,096	10.3	11,700	5.6	13,400	14,900	27.4
Blaine	6,727	6,999	4.0	6,900	- 1.3	6,800	6,600	- 4.3
Broadwater	2,526	3,267	29.3	3,500	6.9	3,300	3,300	- 5.7
Carbon	7,080	8,099	14.4	8,500	4.5	8,900	9,900	16.5
Carter	1,956	1,799	- 8.0	1,700	- 3.4	1,700	1,500	- 11.8
Cascade	81,804	80,698	- 1.4	79,400	- 1.6	86,000	92,100	16.0
Chouteau	6,473	6,092	- 5.9	5,900	- 3.0	6,100	5,800	- 1.7
Custer	12,174	13,109	7.7	13,200	0.3	13,700	14,500	9.8
Daniels	3,083	2,835	- 8.0	2,600	- 6.7	2,600	2,300	- 11.5
Dawson	11,269	11,805	4.8	11,400	- 3.4	11,900	12,200	7.0
Deer Lodge	15,652	12,518	- 20.0	10,700	- 14.1	10,500	9,900	- 7.5
Fallon	4,050	3,763	- 7.1	3,600	- 3.3	3,800	3,800	5.6
Fergus	12,611	13,076	3.7	12,500	- 4.0	13,300	13,600	8.8
Flathead	39,460	51,966	31.7	57,800	11.2	58,500	65,500	13.3
Gallatin	32,505	42,865	31.9	47,800	11.5	48,800	55,100	15.4
Garfield	1,796	1,656	- 7.8	1,700	0.7	1,600	1,400	- 17.6
Glacier	10,783	10,628	- 1.4	11,200	5.4	11,100	11,600	3.6
Golden Valley	931	1,026	10.2	1,100	7.5	900	900	- 18.2
Granite	2,737	2,700	- 1.4	2,700	- 0.8	2,700	2,700	0.0
Hill	17,358	17,985	3.6	18,000	0.0	19,000	20,100	11.7
Jefferson	5,238	7,029	34.2	8,100	15.5	8,200	9,600	18.5
Judith Basin	2,667	2,646	- 0.8	2,600	- 2.9	2,400	2,200	- 15.4
Lake	14,445	19,056	31.9	20,600	7.8	21,300	23,500	14.1
Lewis & Clark	33,281	43,039	29.3	46,400	7.8	51,100	59,500	28.2
Liberty	2,359	2,329	- 1.3	2,400	4.3	2,300	2,200	- 8.3
Lincoln	18,063	17,752	- 1.7	18,600	4.6	18,300	18,700	0.5
Madison	5,014	5,448	8.7	5,700	4.6	5,700	5,700	0.0
McCone	2,875	2,702	- 6.0	2,500	5.9	2,500	2,300	- 8.0
Meagher	2,122	2,154	1.5	2,200	1.7	2,200	2,200	0.0
Mineral	2,958	3,675	24.2	3,700	- 0.6	3,900	4,100	10.8
Missoula	58,263	76,016	30.5	77,700	2.2	84,800	96,800	24.6
Musselshell	3,734	4,478	18.6	4,600	4.9	4,600	4,600	0.0
Park	11,261	12,935	14.9	13,200	2.1	13,900	14,700	11.4
Petroleum	675	655	- 3.0	600	- 2.4	600	500	- 16.7
Phillips	5,386	5,367	0.4	5,500	2.6	5,300	5,200	- 5.5
Pondera	6,611	6,731	1.8	6,700	- 0.8	6,700	6,500	- 3.0
Powder River	2,862	2,520	- 11.9	2,400	- 5.3	2,600	2,600	8.3
Powell	6,660	6,958	4.5	6,900	- 1.0	7,200	7,500	8.7
Prairie	1,752	1,836	4.8	1,700	- 5.2	1,700	1,600	- 5.9
Ravalli	14,409	22,493	56.1	25,000	11.0	25,400	29,200	16.8
Richland	9,837	12,243	24.5	13,400	9.2	13,300	13,400	0.0
Roosevelt	10,365	10,467	1.0	11,700	11.4	10,800	11,200	- 4.3
Rosebud	6,032	9,899	64.1	12,300	24.7	12,700	13,200	7.3
Sanders	7,093	8,675	22.3	8,900	2.3	8,900	9,400	5.6
Sheridan	5,779	5,414	- 6.3	5,700	4.7	5,200	5,000	- 12.3
Silver Bow	41,981	38,092	- 9.3	34,000	- 10.6	35,300	31,700	- 6.8
Stillwater	4,632	5,598	20.9	6,200	10.0	6,800	6,200	0.0
Sweet Grass	2,980	3,216	7.9	3,300	2.0	3,700	3,600	9.1
Teton	6,116	6,491	6.1	6,400	- 0.9	6,500	6,400	0.0
Toole	5,839	5,559	- 4.8	5,500	- 0.5	5,700	5,700	4.0
Treasure	1,069	981	- 8.2	1,000	1.3	900	800	- 20.0
Valley	11,471	10,250	- 10.6	9,300	- 8.8	9,900	9,800	5.4
Wheatland	2,529	2,359	- 6.7	2,200	- 8.2	2,200	2,100	- 4.5
Wibaux	1,465	1,476	0.8	1,300	- 9.6	1,500	1,300	0.0
Yellowstone	87,367	108,035	23.7	120,100	11.2	133,000	160,400	33.6
State Total:	694,409	786,690	13.3	819,000	4.1	859,900	935,600	14.2

Source: U.S. Bureau of the Census. Compiled by Office of Economic Analysis, Montana Department of Commerce, 1987.

APPENDIX D: HISTORICAL PER CAPITA PERSONAL INCOME, BY COUNTY

County	1980	1981	1982	1983	1984	1985
Beaverhead	10,012	9,208	9,068	9,006	8,840	7,273
Big Horn	8,799	7,744	7,576	7,400	7,777	6,960
Blaine	7,439	8,195	8,048	7,901	7,443	5,762
Broadwater	7,344	8,439	8,247	7,910	7,903	6,559
Carbon	9,011	9,305	9,099	8,925	8,642	7,780
Carter	8,685	8,666	7,608	7,193	6,747	6,051
Cascade	10,283	10,250	10,092	10,176	10,211	9,712
Chouteau	9,191	11,214	10,758	10,529	9,306	6,151
Custer	10,779	10,489	9,943	10,148	9,928	9,029
Daniels	9,918	10,444	10,585	10,528	9,610	6,933
Dawson	10,273	11,325	10,567	9,949	9,852	8,715
Deer Lodge	8,418	8,052	7,482	7,762	8,175	8,369
Fallon	10,661	11,350	9,425	8,970	8,920	7,991
Fergus	9,092	9,605	9,516	9,625	9,375	7,951
Flathead	9,309	9,519	9,119	9,298	10,084	10,162
Gallatin	8,494	8,762	8,709	8,787	8,936	8,634
Garfield	9,872	9,931	10,128	10,052	7,877	2,000
Glacier	10,633	10,329	9,532	9,111	9,238	7,879
Golden Valley	9,068	6,691	6,378	6,571	6,041	5,412
Granite	8,833	8,510	8,396	8,566	8,153	6,834
Hill	9,629	10,247	9,786	9,725	9,645	8,267
Jefferson	8,318	8,276	8,690	8,246	8,321	7,641
Judith Basin	7,879	7,493	7,829	7,581	6,580	4,690
Lake	6,796	7,269	7,450	7,417	7,602	7,267
Lewis & Clark	10,996	11,041	11,064	11,194	11,292	10,934
Liberty	13,286	14,402	11,677	11,207	9,034	4,392
Lincoln	7,634	7,729	7,668	7,892	8,293	8,026
Madison	7,975	8,170	8,414	8,264	7,749	5,918
McCone	9,458	10,483	10,666	10,839	9,048	3,859
Meagher	10,003	8,673	7,881	7,649	7,598	6,294
Mineral	8,175	8,326	8,117	8,585	8,752	8,287
Missoula	9,404	9,077	9,124	9,458	10,044	9,998
Musselshell	9,978	9,720	9,787	8,627	8,846	8,357
Park	9,007	8,721	8,855	8,729	8,974	8,634
Petroleum	10,038	7,604	3,960	3,913	3,448	2,358
Phillips	8,813	9,826	8,224	8,195	8,296	7,913
Pondera	9,118	10,388	10,827	10,604	9,720	6,493
Powder River	9,745	10,212	10,397	9,580	8,867	6,086
Powell	9,632	9,642	10,231	10,228	10,089	9,025
Prairie	8,781	8,174	7,121	7,134	7,019	6,626
Ravalli	7,910	7,994	7,802	7,762	8,049	7,913
Richland	10,798	12,199	9,523	8,467	9,070	8,473
Roosevelt	8,627	9,141	8,304	8,488	8,291	7,372
Rosebud	8,947	9,554	10,854	10,161	12,141	12,234
Sanders	7,808	7,845	7,589	7,744	8,158	7,893
Sheridan	10,861	12,320	11,057	11,065	10,157	6,887
Silver Bow	9,618	9,743	10,632	10,581	11,519	11,842
Stillwater	8,699	9,396	9,359	8,971	8,754	7,233
Sweet Grass	9,115	9,616	9,936	9,651	9,031	7,011
Teton	9,398	10,472	9,633	9,048	8,928	7,713
Toole	13,421	14,814	12,701	12,314	11,204	5,933
Treasure	9,050	9,091	9,621	9,516	8,168	4,656
Valley	9,597	11,722	9,441	9,449	9,114	7,942

APPENDIX D: HISTORICAL PER CAPITA PERSONAL INCOME, BY COUNTY

County	1980	1981	1982	1983	1984	1985
Wheatland	10,071	10,671	10,127	9,787	9,200	7,104
Wibaux	7,115	6,894	6,511	7,093	6,746	5,831
Yellowstone	11,242	11,337	11,437	11,306	11,608	11,097

Source: National Planning Association Statistics.

APPENDIX D: HISTORY OF TOTAL JOBS, BY COUNTY

County	1970	1980	1981	1982	1983	1984
Beaverhead	3,043	3,854	3,754	3,910	3,977	4,009
Big Horn	3,931	5,717	5,135	4,918	4,821	4,884
Blaine	2,669	2,992	3,002	2,984	2,998	3,072
Broadwater	1,081	1,451	1,435	1,437	1,485	1,534
Carbon	2,921	3,255	3,295	3,325	3,428	3,492
Carter	958	916	907	927	899	898
Cascade	36,150	41,610	40,768	39,905	40,292	40,836
Chouteau	2,895	2,952	2,957	2,985	2,979	2,962
Custer	5,436	6,987	6,632	6,494	6,612	6,685
Daniels	1,509	1,554	1,602	1,689	1,595	1,580
Dawson	5,155	6,533	6,911	6,941	6,421	6,291
Deer Lodge	6,255	4,159	3,796	3,481	3,597	3,733
Fallon	1,780	2,211	2,159	2,116	2,024	2,035
Fergus	5,420	6,224	6,093	5,908	5,933	5,927
Flathead	15,325	23,684	23,073	22,601	24,111	25,905
Gallatin	13,274	21,767	22,011	22,933	23,831	24,658
Garfield	909	886	853	901	916	926
Glacier	4,191	6,264	5,900	5,827	5,862	5,792
Golden Valley	421	387	391	380	382	400
Granite	1,116	1,192	1,178	1,190	1,209	1,278
Hill	7,509	9,473	9,259	9,157	9,106	9,116
Jefferson	1,872	2,184	2,253	2,490	2,614	2,712
Judith Basin	1,183	1,229	1,208	1,260	1,227	1,251
Lake	4,796	6,682	6,719	6,855	7,081	7,244
Lewis & Clark	16,944	25,140	25,264	25,172	25,681	26,294
Liberty	1,143	1,260	1,218	1,191	1,194	1,192
Lincoln	7,111	6,858	6,945	6,780	7,218	7,215
Madison	2,177	2,619	2,598	2,798	2,765	2,773
McCone	1,460	1,479	1,458	1,557	1,493	1,470
Meagher	892	1,017	955	970	977	956
Mineral	1,153	1,570	1,545	1,397	1,577	1,659
Missoula	24,607	38,706	36,476	35,668	37,387	39,369
Musselshell	1,544	1,938	2,072	2,014	1,935	1,917
Park	4,581	5,781	5,804	5,758	5,668	5,864
Petroleum	331	306	288	291	293	290
Phillips	2,216	2,681	2,616	2,678	2,739	2,824
Pondera	2,837	3,282	3,236	3,203	3,274	3,288
Powder River	1,283	1,438	1,433	1,504	1,455	1,376
Powell	2,580	3,150	3,023	3,135	3,171	3,197
Prairie	843	1,044	913	949	941	946
Ravalli	5,003	7,089	7,153	7,046	7,343	7,604
Richland	4,397	7,218	8,349	7,590	6,818	7,235
Roosevelt	4,309	5,348	5,259	5,464	5,563	5,644
Rosebud	2,580	5,053	6,208	7,579	7,259	6,104
Sanders	2,792	4,093	3,868	7,762	3,947	4,127
Sheridan	2,589	3,104	3,334	3,199	3,043	3,074
Silver Bow	16,187	16,902	17,374	16,105	15,468	15,003
Stillwater	1,863	2,218	2,202	2,237	2,282	2,349
Sweet Grass	1,325	1,485	1,454	1,475	1,460	1,501
Teton	2,545	2,972	3,088	3,056	2,960	3,026
Toole	2,908	3,263	3,420	3,116	3,087	3,120
Treasure	507	506	480	487	485	494
Valley	5,109	5,019	5,165	4,726	4,600	4,639

APPENDIX D: HISTORY OF TOTAL JOBS, BY COUNTY

County	1970	1980	1981	1982	1983	1984
Wheatland	1,195	1,225	1,158	1,182	1,166	1,214
Wibaux	623	694	694	684	672	665
Yellowstone	38,620	59,429	60,267	61,396	62,572	64,495
State Total:	294,051	388,050	386,608	388,783	389,893	398,444

*1985 data not available.

Source: U.S. Bureau of the Census. Compiled by Office of Economic Analysis, Montana Department of Commerce, 1986.

APPENDIX E - ECONOMIC WORKSHEET 1
ON-SITE AIRPORT EMPLOYMENT

County	No. of Airports	Local Government Employment	Other Air Transportation Employment	Other Employment	Total On-Site Airport Employment
Beaverhead	3	1.5	1	1.0	3.5
Big Horn	2	1.0	0	1.0	2.0
Blaine	4	0.0	0	3.5	3.5
Broadwater	2	1.0	0	1.0	2.0
Carbon	2	1.0	0	1.5	2.5
Carter	1	0.0	0	3.5	3.5
Cascade	1	37.0	161	422.0	620.0
Chouteau	3	1.0	1	10.0	12.0
Custer	1	1.0	6	11.0	18.0
Daniels	2	1.0	0	1.5	2.5
Dawson	2	1.0	4	0.0	5.0
Deer Lodge	1	1.0	0	4.5	5.5
Fallon	1	0.5	0	4.0	4.5
Fergus	3	1.0	7	20.0	28.0
Flathead	7	12.0	67	8.0	87.0
Gallatin	3	9.5	75	75.5	160.0
Garfield	1	0.0	0	1.0	1.0
Glacier	4	3.0	0	14.0	17.0
Golden Valley	2	0.0	0	0.0	0.0
Granite	2	0.0	0	1.0	1.0
Hill	1	1.0	8	1.0	10.0
Jefferson	1	0.0	0	0.0	0.0
Judith Basin	1	1.0	0	0.0	1.0
Lake	3	0.0	1	2.5	3.5
Lewis & Clark	5	38.0	41	410.0	489.0
Liberty	2	0.0	0	10.0	10.0
Lincoln	3	0.5	0	0.0	0.5
Madison	2	1.0	0	3.0	4.0
McCone	1	0.0	0	0.5	0.5
Meagher	1	0.0	0	0.0	0.0
Mineral	1	0.0	0	0.0	0.0
Missoula	4	28.0	107	208.0	343.0
Musselshell	1	0.0	0	10.0	10.0
Park	3	0.5	0	8.0	8.5
Petroleum	0	0.0	0	0.0	0.0
Phillips	2	0.0	1	2.0	3.0
Pondera	2	0.0	0	3.0	3.0
Powder River	2	0.0	0	2.0	2.0
Powell	1	0.0	0	0.0	0.0
Prairie	1	0.0	0	0.0	0.0
Ravalli	2	1.0	8	0.0	9.0
Richland	2	2.0	8	6.0	16.0
Roosevelt	3	2.0	6	0.5	8.5
Rosebud	2	0.0	0	2.0	2.0

APPENDIX E - ECONOMIC WORKSHEET 1
ON-SITE AIRPORT EMPLOYMENT

County	No. of Airports	Local Government Employment	Other Air Transportation Employment	Other Employment	Total On-Site Airport Employmen
Sanders	3	0.0	0	0.0	0.0
Sheridan	1	0.0	0	1.5	1.5
Silver Bow	1	9.0	16	65.0	90.0
Stillwater	1	0.0	0	1.0	1.0
Sweet Grass	1	1.0	0	6.0	7.0
Teton	3	1.0	0	0.0	1.0
Toole	3	1.0	0	4.0	5.0
Treasure	1	0.0	0	0.0	0.0
Valley	4	1.0	8	11.0	20.0
Wheatland	1	0.0	0	0.0	0.0
Wibaux	0	0.0	0	0.0	0.0
Yellowstone	2	45.0	328	278.0	651.0
State Total:	114	205.5	854	1619.0	2678.5

APPENDIX E - ECONOMIC WORKSHEET 2
EMPLOYEE AND PROPRIETOR EARNINGS
(ON-SITE AIRPORT EMPLOYMENT)

County	Local Government Employee Income	Other Air Transportation Employee Income	Other Other Employee Income	Total On-Site Employee Income
Beaverhead	$22,575.0	$22,686.0	$20,637.0	$65,898.0
Big Horn	16,175.0	0.0	20,637.0	36,812.0
Blaine	0.0	0.0	72,229.5	72,229.5
Broadwater	13,190.0	0.0	20,637.0	33,827.0
Carbon	14,173.0	0.0	30,955.5	45,128.5
Carter	0.0	0.0	72,229.5	72,229.5
Cascade	650,682.0	3,652,446.0	8,708,814.0	13,011,942.0
Chouteau	13,525.0	22,686.0	206,370.0	242,581.0
Custer	15,028.0	136,116.0	227,007.0	378,151.0
Daniels	13,098.0	0.0	30,955.5	44,053.5
Dawson	15,398.0	90,744.0	0.0	106,142.0
Deer Lodge	16,427.0	0.0	92,866.5	109,293.5
Fallon	7,823.5	0.0	82,548.0	90,371.5
Fergus	13,877.0	158,802.0	412,740.0	585,419.0
Flathead	206,064.0	1,519,962.0	165,096.0	1,891,122.0
Gallatin	152,608.0	1,701,450.0	1,558,093.5	3,412,151.5
Garfield	0.0	0.0	20,637.0	20,637.0
Glacier	50,457.0	0.0	288,918.0	339,375.0
Golden Valley	0.0	0.0	0.0	0.0
Granite	0.0	0.0	20,637.0	20,637.0
Hill	17,000.0	181,488.0	20,637.0	219,125.0
Jefferson	0.0	0.0	0.0	0.0
Judith Basin	13,827.0	0.0	0.0	13,827.0
Lake	0.0	22,686.0	51,592.5	74,278.5
Lewis & Clark	687,800.0	930,126.0	8,461,170.0	10,079,096.0
Liberty	0.0	0.0	206,370.0	206,370.0
Lincoln	8,068.0	0.0	0.0	8,068.0
Madison	12,325.0	0.0	61,911.0	74,236.0
McCone	0.0	0.0	10,318.5	10,318.5
Meagher	0.0	0.0	0.0	0.0
Mineral	0.0	0.0	0.0	0.0
Missoula	507,276.0	2,427,402.0	4,292,496.0	7,227,174.0
Musselshell	0.0	0.0	206,370.0	206,370.0
Park	8,195.5	0.0	165,096.0	173,291.5
Petroleum	0.0	0.0	0.0	0.0
Phillips	0.0	22,686.0	41,274.0	63,960.0
Pondera	0.0	0.0	61,911.0	61,911.0
Powder River	0.0	0.0	41,274.0	41,274.0
Powell	0.0	0.0	0.0	0.0
Prairie	0.0	0.0	0.0	0.0
Ravalli	15,480.0	181,488.0	0.0	196,968.0
Richland	33,578.0	181,488.0	123,822.0	338,888.0
Roosevelt	33,600.0	136,116.0	10,318.5	180,034.5
Rosebud	0.0	0.0	41,274.0	41,274.0

APPENDIX E - ECONOMIC WORKSHEET 2
EMPLOYEE AND PROPRIETOR EARNINGS
(ON-SITE AIRPORT EMPLOYMENT)

County	Local Government Employee Income	Other Air Transportation Employee Income	Other Other Employee Income	Total On-Site Employee Income
Sanders	0.0	0.0	0.0	0.0
Sheridan	0.0	0.0	30,955.5	30,955.5
Silver Bow	176,103.0	362,976.0	1,341,405.0	1,880,484.0
Stillwater	0.0	0.0	20,637.0	20,637.0
Sweet Grass	12,311.0	0.0	123,822.0	136,133.0
Teton	14,068.0	0.0	0.0	14,068.0
Toole	13,294.0	0.0	82,548.0	95,842.0
Treasure	0.0	0.0	0.0	0.0
Valley	16,623.0	181,488.0	227,007.0	425,118.0
Wheatland	0.0	0.0	0.0	0.0
Wibaux	0.0	0.0	0.0	0.0
Yellowstone	785,430.0	7,441,008.0	5,737,086.0	13,963,524.0
State Total:	$3,576,079.0	$19,373,844.0	$33,411,303.0	$56,361,226.0

APPENDIX E - ECONOMIC WORKSHEET 3
INDIRECT ECONOMIC IMPACTS OF AVIATION

County	Air Carrier Passenger Expenditures	Gemera; Aviation Visitor Expenditures	Total Air Trveler Expenditures	Percent Air Travel Only	Local Income Capture Rate	Adjusted Total Income From Air Traveler Expenditures
Beaverhead		$34,057	$34,057	0.5	0.25	$4,257.1
Big Horn		34,311	34,311	0.5	0.25	4,288.9
Blaine		86,414	86,414	0.5	0.25	10,801.7
Broadwater		23,033	23,033	0.5	0.25	2,879.1
Carbon		30,181	30,181	0.5	0.25	3,772.7
Carter		16,203	16,203	0.5	0.25	2,025.3
Cascade	17,455,900	213,117	17,669,017	0.5	0.25	2,208,627.2
Chouteau		83,554	83,554	0.5	0.25	10,444.3
Custer	199,400	58,297	257,697	0.5	0.25	32,212.2
Daniels		26,369	26,369	0.5	0.25	3,296.1
Dawson	180,000	57,503	237,503	0.5	0.25	29,687.9
Deer Lodge		19,380	19,380	0.5	0.25	2,422.4
Fallon		40,824	40,824	0.5	0.25	5,103.0
Fergus	58,750	51,626	110,376	0.5	0.25	13,797.0
Flathead	6,487,200	475,275	6,962,475	0.5	0.25	870,309.3
Gallatin	12,689,200	231,283	12,920,483	0.5	0.25	1,615,060.4
Garfield		12,708	12,708	0.5	0.25	1,588.5
Glacier		53,691	53,691	0.5	0.25	6,711.3
Golden Valley		1,716	716	0.5	0.25	214.4
Granite		15,091	15,091	0.5	0.25	1,886.3
Hill	105,750	76,883	182,633	0.5	0.25	22,829.1
Jefferson		10,484	10,484	0.5	0.25	1,310.5
Judith Basin		17,473	17,473	0.5	0.25	2,184.2
Lake		61,633 6	1,633	0.5	0.25	7,704.2
Lewis & Clark	5,865,600	230,966	6,096,566	0.5	0.25	762,070.7
Liberty		34,629	34,629	0.5	0.25	4,328.6
Lincoln		46,860	46,860	0.5	0.25	5,857.5
Madison		34,629	34,629	0.5	0.25	4,328.6
McCone		20,968	20,968	0.5	0.25	2,621.0
Meagher		12,867	12,867	0.5	0.25	1,608.3
Mineral		20,809	20,809	0.5	0.25	2,601.1
Missoula	15,413,650	281,168	15,694,818	0.5	0.25	1,961,852.3
Musselshell		22,556	22,556	0.5	0.25	2,819.6
Park		56,074	56,074	0.5	0.25	7,009.2
Petroleum		0	0	0.5	0.25	0.0
Phillips		43,524	43,524	0.5	0.25	5,440.6
Pondera		44,319	44,319	0.5	0.25	5,539.8
Powder River		16,361	16,361	0.5	0.25	2,045.2
Powell		18,585	18,585	0.5	0.25	2,323.2
Prairie		11,755	11,755	0.5	0.25	1,469.3
Ravalli		98,486	98,486	0.5	0.25	12,310.8
Richland	900,300	87,526	987,826	0.5	0.25	123,478.2
Roosevelt	212,450	87,208	299,658	0.5	0.25	37,457.2
Rosebud		38,600	38,600	0.5	0.25	4,825.0
Sanders		25,098	25,098	0.5	0.25	3,137.3
Sheridan		41,936	41,936	0.5	0.25	5,242.0
Silver Bow	3,300,100	81,013	3,381,113	0.5	0.25	422,639.1
Stillwater		30,499	30,499	0.5	0.25	3,812.4
Sweet Grass		21,762	21,762	0.5	0.25	2,720.3
Teton		55,120	55,120	0.5	0.25	6,890.1
Toole		40,506	40,506	0.5	0.25	5,063.3
Treasure		2,542	2,542	0.5	0.25	317.7
Valley	300,200	71,958	372,158	0.5	0.25	46,519.8
Wheatland		15,249	15,249	0.5	0.25	1,906.2
Wibaux		0	0	0.5	0.25	0.0
Yellowstone	38,130,400	516,486	38,646,886	0.5	0.25	4,830,860.8
State Total:	$101,298,900	$3,841,166	$105,140,066	—	—	$13,142,508.3

EXHIBIT E -WORKSHEET 4
INDUCED INCOME EFFECTS OF AVIATION IN MONTANA

County	Total On-Site Employee Income	Adjusted Local Income from Air Traveler Expenditures	Total Basic Income	Income Multiplier	Induced Income
Beaverhead	$65,898	$4,257	$70,155	0.23	$16,136
Big Horn	36,812	4,289	41,101	0.66	27,127
Blaine	7,230	10,802	18,031	0.23	4,147
Broadwater	33,827	2,879	36,706	0.23	8,442
Carbon	45,129	3,773	48,901	0.23	11,247
Carter	7,230	2,025	9,255	0.23	2,129
Cascade	13,011,942	2,208,627	15,220,569	1.02	15,524,981
Chouteau	242,581	10,444	253,025	0.23	58,196
Custer	378,151	32,212	410,363	0.66	270,840
Daniels	44,054	3,296	47,350	0.23	10,890
Dawson	106,142	29,688	135,830	0.66	89,648
Deer Lodge	109,294	2,422	111,716	0.66	73,733
Fallon	90,372	5,103	95,475	0.23	21,959
Fergus	585,419	13,797	599,216	0.66	395,483
Flathead	1,891,122	870,309	2,761,431	1.02	2,816,660
Gallatin	3,412,152	1,615,060	5,027,212	1.02	5,127,756
Garfield	20,637	1,588	22,225	0.23	5,112
Glacier	339,375	6,711	346,086	0.66	228,417
Golden Valley	0	214	214	0.23	49
Granite	20,637	1,886	22,523	0.23	5,180
Hill	219,125	22,829	241,954	0.66	159,690
Jefferson	0	1,311	1,311	0.23	301
Judith Basin	13,827	2,184	16,011	0.23	3,683
Lake	74,279	7,704	81,983	0.66	54,109
Lewis & Clark	10,079,096	762,071	10,841,167	1.02	11,057,990
Liberty	206,370	4,329	210,699	0.23	48,461
Lincoln	8,068	5,858	13,926	0.66	9,191
Madison	74,236	4,329	78,565	0.23	18,070
McCone	10,319	2,621	12,940	0.23	2,976
Meagher	0	1,608	1,608	0.23	370
Mineral	0	2,601	2,601	0.23	598
Missoula	7,227,174	1,961,852	9,189,026	1.02	9,372,807
Musselshell	206,370	2,820	209,190	0.23	48,114
Park	173,292	7,009	180,301	0.66	118,998
Petroleum	0	0	0	---	0
Phillips	63,960	5,441	69,401	0.23	15,962
Pondera	61,911	5,540	67,451	0.23	15,514
Powder River	41,274	2,045	43,319	0.23	9,963
Powell	0	2,323	2,323	0.23	534
Prairie	0	1,469	1,469	0.23	338
Ravalli	196,968	12,311	209,279	0.66	138,124
Richland	338,888	123,478	462,366	0.66	305,162
Roosevelt	180,035	37,457	217,492	0.66	143,545
Rosebud	41,274	4,825	46,099	0.66	30,425
Sanders	0	3,137	3,137	0.23	722
Sheridan	30,956	5,242	36,198	0.23	8,325
Silver Bow	1,880,484	422,639	2,303,123	1.02	2,349,186
Stillwater	20,637	3,812	24,449	0.23	5,623
Sweet Grass	136,133	2,720	138,853	0.23	31,936
Teton	14,068	6,890	20,958	0.23	4,820
Toole	95,842	5,063	100,905	0.23	23,208
Treasure	0	318	318	0.23	73
Valley	425,118	46,520	471,638	0.66	311,281
Wheatland	0	1,906	1,906	0.23	438
Wibaux	0	0	0	---	0
Yellowstone	13,963,524	4,830,861	18,794,385	1.02	19,170,272
State Total:	$56,231,226	$13,142,508	$69,373,734	---	$68,158,940

EXHIBIT E - ECONOMIC WORKSHEET 5
SUMMARY OF ECONOMIC IMPACTS
OF AVIATION IN MONTANA

County	On-Site Airport Employment	Total On-Site and Derivative Employment	Total On-Site Employment Income	Adjusted Local Income From Traveler Expenditures	Total Basic Income	Induced Income	Total Economic Impact
Beaverhead	3.5	4.4	$65,898.0	$4,257	$70,155	$16,136	$86,291
Big Horn	2.0	2.8	36,812.0	4,289	41,101	27,127	68,228
Blaine	3.5	5.2	72,229.5	10,802	18,031	4,147	22,178
Broadwater	2.0	2.6	33,827.0	2,879	36,706	8,442	45,149
Carbon	2.5	3.9	45,128.5	3,773	48,901	11,247	60,148
Carter	3.5	4.3	72,229.5	2,025	9,255	2,129	11,383
Cascade	620.0	1,490.2	13,011,942.0	2,208,627	15,220,569	15,524,981	30,745,550
Chouteau	12.0	15.2	242,581.0	10,444	253,025	58,196	311,221
Custer	18.0	28.9	378,151.0	32,212	410,363	270,840	681,203
Daniels	2.5	3.3	44,053.5	3,296	47,350	10,890	58,240
Dawson	5.0	7.8	106,142.0	29,688	135,830	89,648	225,478
Deer Lodge	5.5	7.8	109,293.5	2,422	111,716	73,733	185,448
Fallon	4.5	5.9	90,371.5	5,103	95,475	21,959	117,434
Fergus	28.0	33.5	585,419.0	13,797	599,216	395,483	994,699
Flathead	87.0	208.6	1,891,122.0	870,309	2,761,431	2,816,660	5,578,091
Gallatin	160.0	506.6	3,412,151.5	1,615,060	5,027,212	5,127,756	10,154,968
Garfield	1.0	1.3	20,637.0	1,588	22,225	5,112	27,337
Glacier	17.0	20.8	339,375.0	6,711	346,086	228,417	574,503
Golden Valley	0.0	0.0	0.0	214	214	49	264
Granite	1.0	1.4	20,637.0	1,886	22,523	5,180	27,704
Hill	10.0	16.6	219,125.0	22,829	241,954	159,690	401,644
Jefferson	0.0	0.1	0.0	1,311	1,311	30	1 1,612
Judith Basin	1.0	1.6	13,827.0	2,184	16,011	3,683	19,694
Lake	3.5	4.6	74,278.5	7,704	81,983	54,109	136,091
Lewis & Clark	489.0	1,012.2	10,079,096.0	762,071	10,841,167	11,057,990	21,899,157
Liberty	10.0	12.0	206,370.0	4,329	210,699	48,461	259,15
Lincoln	0.5	1.1	8,068.0	5,858	13,926	9,191	23,116
Madison	4.0	5.2	74,236.0	4,329	78,565	18,070	96,634
McCone	0.5	0.8	10,318.5	2,621	12,940	2,976	15,916
Meagher	0.0	0.2	0.0	1,608	1,608	370	1,978
Mineral	0.0	0.3	0.0	2,601	2,601	598	3,199
Missoula	343.0	879.9	7,227,174.0	1,961,852	9,189,026	9,372,807	18,561,833
Musselshell	10.0	11.6	206,370.0	2,820	209,190	48,114	257,303
Park	8.5	12.7	173,291.5	7,009	180,301	118,998	299,299
Petroleum	0.0	0.0	0.0	0	0	0	0
Phillips	3.0	4.1	63,960.0	5,441	69,401	15,962	85,363
Pondera	3.0	4.0	61,911.0	5,540	67,451	15,514	82,965
Powder River	2.0	2.7	41,274.0	2,045	43,319	9,963 53,283	
Powell	0.0	0.2	0.0	2,323	2,323	534	2,857
Prairie	0.0	0.2	0.0	1,469	1,469 33	8	1,807
Ravalli	9.0	11.3	196,968.0	12,311	209,279	138,124	347,403
Richland	16.0	37.0	338,888.0	123,478	462,366	305,162	767,528
Roosevelt	8.5	16.8	180,034.5	37,457	217,492	143,545	361,036
Rosebud	2.0	2.9	41,274.0	4,825	46,099	30,425	76,524
Sanders	0.0	0.3	0.0	3,137	3,137	722	3,859
Sheridan	1.5	2.2	30,955.5	5,242	36,198	8,325	44,523
Silver Bow	90.0	192.7	1,880,484.0	422,639	2,303,123	2,349,186	4,652,309
Stillwater	1.0	1.5	20,637.0	3,812	24,449	5,623	30,073
Sweet Grass	7.0	8.1	136,133.0	2,720	138,853	31,936	170,790
Teton	1.0	1.9	14,068.0	6,890	20,958	4,820	25,778
Toole	5.0	6.2	95,842.0	5,063	100,905	23,208	124,114
Treasure	0.0	0.0	0.0	318	318	73	391
Valley	20.0	33.5	425,118.0	46,520	471,638	311,281	782,919
Wheatland	0.0	0.2	0.0	1,906	1,906	438	2,345
Wibaux	0.0	0.0	0.0	0	0	0	0
Yellowstone	651.0	1,700.7	13,963,524.0	4,830,861	18,794,385	19,170,272	37,964,657
State Total:	2,678.5	6,339.9	$56,361,226.0	$13,142,508.3	$69,373,734	$68,158,940	$137,532,675